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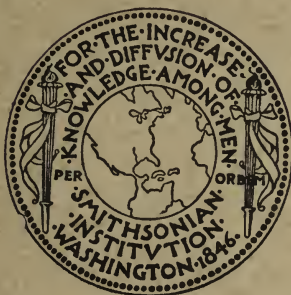
ANNOTATED LIST OF THE RECENT BRACHIOPODA
IN THE COLLECTION OF THE UNITED STATES
NATIONAL MUSEUM, WITH DESCRIPTIONS
OF THIRTY-THREE NEW FORMS

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BY

WILLIAM HEALEY DALL

Honorary Curator of Mollusks, United States National Museum

No. 2314.—From the Proceedings of the United States National Museum
Vol. 57, pages 261-377



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By WILLIAM HEALEY DALL,

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The collection of recent Brachiopods, in the United States Museum began with the material obtained by the United States Exploring Expedition under Wilkes, mostly in the Magellanic region. Since then the chief additions have been received from the dredgings of the steamers of the United States Coast Survey and the United States Fish Commission, now the Bureau of Fisheries; my own dredgings in the North Pacific and Bering Sea; and the material in the Jeffreys Collection purchased by the United States National Museum, chiefly comprising specimens from the North Atlantic and the Mediterranean Sea. Valuable contributions have been received from the West Indies and Florida dredgings of Mr. J. B. Henderson, jr., and from the University of Tokio, collected by Prof. E. S. Morse. Miscellaneous small purchases and exchanges have filled various gaps.

The total reserve series now contains 181 different forms represented by over 6,000 specimens from various localities, including many original types, and of these some 33 are new. Our principal weakness lies in the absence of some recently described forms from the southern hemisphere, and a few of the abyssal rarities.

I have not had the privilege of examining the collection of the late Thomas Davidson now in the paleontological department of the British Museum (Natural History), but with this possible exception the collection in the United States National Museum is, I believe unrivaled.

In the preparation of the list the classification of Beecher and Schuchert has in the main been followed, supplemented by data from later researches.

In reviewing the nomenclature it was found that some changes were necessary, due to the fact that Dr. Thomas Davidson, Mr. J. Gwyn Jeffreys and some others of the earlier writers seem to have been little interested in this branch of the subject, and often included in their synonymy admittedly earlier names than those they habitually used, with no consideration of the claims of priority, as in the case of the two species described by Pallas, of which one was accepted

and the other ignored, though the latter was completely identified. Moreover, in the case of Doctor Davidson's Monograph of the Recent Brachiopoda, his premature death before publication left his synonymy in such a confused condition that it is absolutely essential to verify every reference by an inspection of the original work cited, if accuracy is to be secured.

All this has resulted in changes, some of which will no doubt be much regretted, but which are inevitable if the character of the work here presented is to be kept up to the ordinary standard of accuracy.

In tabulating the specimens the column under "Collector" refers not only to the actual collector but, when he is not known, to the source from which the specimen was received. "B. F." is an abbreviation for the Bureau of Fisheries, formerly the United States Fish Commission. When practicable the depth is also cited, but for most of these cases much more information, such as temperature of the water, character of the bottom, etc., is also on record.

It is hoped to supply figures of the new forms at a later opportunity. Specimens suitable for filling gaps in the collection, or enlarging scanty series, are much desired. Collectors or dealers having such material available are requested to communicate with the United States National Museum.

Class BRACHIOPODA.

Order ATREMATA.

Family LINGULIDAE.

Genus LINGULA Bruguière.

Lingula BRUGUIÈRE, Encycl. Méth., vol. 1, pl. 250, figs. 1a-c, 1798.—LAMARCK, Prodrôme, p. 89, 1799, type *Patella unguis* Linnaeus.

LINGULA UNGUIS Linnaeus.

Patella unguis LINNAEUS, Syst. Nat., ed. 10, p. 783, No. 671, 1758. Amboyna.—GMELIN, vol. 1, pt. 6, p. 3710, No. 95, 1792.

Mytilus lingua SOLANDER, Portland Catalogue, p. 77, No. 1718, 1786.—DILLWYN, Descr. Cat. Rec. Shells, vol. 1, p. 322, 1817.

Des lingules CUVIER, Bull. Soc. Philom., vol. 1, p. 111, pl. 7, figs. A, B, C, 1797.

Mytilus camellii SHAW, Nat. Misc., vol. 9, pl. 315, 1798 (lower figures).

Pharetra monoculoides BOLTON, Mus., p. 159, No. 46, 1798.

Lingula unguis LAMARCK, Prodrôme, p. 89, 1799.

Lingula anatina LAMARCK, Syst. des An. s. Vert., p. 141, 1801.—CUVIER, Annales du Muséum, vol. 1, pp. 69-80, 1802; Règne Anim., vol. 2, p. 502, 1816.—LAMARCK, Anim. s. Vert., vol. 6, pt. 1, p. 258, 1819.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 206, pl. 29, figs. 1-8, 1888.

? *Lingula chemnitzii* KÜSTER, Conch. Cab., ed. 2, vol. 7, p. 13, pl. 1, figs. 4-6, 1843.

Lingula affinis HANCOCK, Philos. Trans., vol. 148, pt. 2, 1858.

Lingula hirtula (Gray ms. in) DAVIDSON, Mon. Rec. Brach., vol. 3, p. 206, 1888.

Type locality.—Amboyna, Molucca Islands.

Cat. No.	Locality.	Collector.	Number of specimens.
217312	Northern China, Chihli coast.....	Sowerby.....	1
111035	Batalay Island, Philippines.....	Mearns.....	2
22634	Manila Bay, Philippines.....	Mearns.....	3
76709	Viti Islands.....	Garrett.....	3
77998	Viti Islands.....	Garrett.....	3
88765	Fiji Islands.....	Stearns.....	3

While the specific name of *anatina* has been long in use for this species, there are at least four of earlier date and according to the accepted rules there is no choice except to adopt the earliest one, which is that of Linnaeus.

LINGULA MURPHIANA Reeve.

Lingula murphiana (King Ms.) REEVE, Conch. Icon., pl. 1, fig. 3, Nov., 1859.—

DAVIDSON, Mon. Rec. Brach., pt. 3, p. 215, pl. 29, fig. 11, 1888.

Lingula anatina HANCOCK, Philos. Trans., vol. 148, pt. 2, 1858; not of Lamarck.

Type locality.—Moreton Bay, Australia. Capt. King.

Cat. No.	Locality.	Collector.	Number of specimens.
162638	Northeast Australia.....	Stearns.....	2
77272	Australia.....	Cuming.....	2
2250	Fiji Islands.....	U. S. Ex. Exp.....	2
17830	Vita Leva, near Rawa River.....	U. S. Ex. Exp.....	2
111079	Off Shimbawa Gulf, Japan.....	E. S. Morse.....	1

LINGULA ROSTRUM Shaw.

Mytilus rostrum SHAW, Nat. Misc., vol. 9, pl. 315 (upper figures), 1798.

Lingula hians SWAINSON, Philos. Mag. and Journ., vol. 62, p. 401, 1823.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 216, pl. 29, figs. 12, 13, 1888.

? *Lingula antoni* KÜSTER, Conch. Cab., new. ed., *Brachiopoda*, p. 14, pl. 1, figs. 7-9, 1843.

Type locality.—"Amboina."

Cat. No.	Locality.	Collector.	Number of specimens.
17828	Australia.....	U. S. Ex. Exp.....	3
153321	Amboyna, Moluccas Islands.....	Bickmore.....	1
111037	Amboyna, Moluccas Islands.....	Bickmore.....	1

An examination of Shaw's figures leads to the above identification. They can not at any rate represent *L. unguis*.

LINGULA TRANSLUCIDA, new species.

Valves polished, very thin, more or less translucent, of a ruddy brown, darker distally, paler at the umbones, the margins in drying recurved but not gaping anteriorly, ovate with sharply pointed beaks, the peduncle not greatly longer than the valves; length of dry shell 25, breadth 12, diameter about 5 mm.; the setae short.

Type locality.—Java, Ward.

Cat. No.	Locality.	Collector.	Number of specimens.
174003	Java.....	Ward.....	2
226219	Java.....	Palmer.....	1
150706	Karachi.....	Captain Shopland..	2
332782	Karachi.....	Fulton.....	2
236174	Tataan Island, Philippine Islands, 12 fms....	B. F.....	1

The only described species which approaches this is *Lingula hirundo* Reeve, from Northeast Australia. The latter is described as greenish and the outline is figured as more rectangular. I have not seen specimens, but the differences, taken in connection with the geographical distribution, seem to warrant specific distinction.

Type.—No. 332782, U.S.N.M.

LINGULA ADAMSI Dall.

Lingula tumidula A. ADAMS, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 100, 1863.—DAVIDSON, Proc. Zool. Soc., 1871, p. 310, pl. 30, fig. 1, 1871; not of Reeve, 1841.

Lingula adamsi DALL, Proc. Acad. Nat. Sci. Phila., for 1873, p. 202.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 218, pl. 28, fig. 19, 1838.

Lingula lepidula DUNKER, Index Moll. Mar. Japonici. p. 254, 1882; not of A. Adams, 1863, according to Davidson.

Type locality.—Tsaolian Harbor, Korean Archipelago, in 7 fathoms. A. Adams.

Cat. No.	Locality.	Collector.	Number of specimens.
274151	Shimabara, Japan.....	E. S. Morse.....	2
274152	Akashi, Japan.....	E. S. Morse.....	10
274153	Higabukanseki, Higo, Japan.....	E. S. Morse.....	6

The shell is mottled with dark brown, darkest distally, and is notable for a thin grayish periostracum which is dehiscent in drying. The setae are conspicuously long, and the peduncle in dry specimens nearly twice as long as the valves.

LINGULA BANCROFTI Johnston and Hirschfeld.

Lingula bancrofti JOHNSTON and HIRSCHFELD, Proc. Roy. Soc. Queensland, Australia, vol. 31, No. 6, p. 67, pl. 1, figs. 1-4, text figs. 1-7, Aug. 8, 1919.

Type locality.—Burnett Head, Hervey Bay, Australia.

Cat. No.	Locality.	Collector.	Number of specimens.
333009	Hervey Bay.....	T. L. Bancroft.....	2

Prof. T. Harvey Johnston, of the University of Queensland, Brisbane, Australia, has kindly furnished specimens of this species differing from *L. murphiana* anatomically. One of them is of a light translucent brownish gray color, the other dark green and brown, much resembling externally *L. adamsi* of Japan, but somewhat broader proportionately.

LINGULA EXUSTA Reeve.

Lingula exusta REEVE, Conch. Icon. Mon. Lingula, pl. 2, fig. 9, 1859.—TAPPARONE-CANEFRI, Zool. Viaggio della fregata *Magenta*, 1865-68; Malacologia; Acad. R. Sci. di Torino, ser. 2, vol. 28, 1873.—JOHNSTON and HIRSCHFELD, Proc. Roy. Soc. Queensland, vol. 31, No. 6, p. 63, 1919.

Lingula anatina HEDLEY, Proc. Linn. Soc. New South Wales, vol. 23, 1898, according to Johnston, Proc. Roy. Soc. Queensland, vol. 31, No. 6, p. 63, 1919.

Type locality.—Moreton Bay, Australia; Strange.

Cat. No.	Locality.	Collector	Number of specimens.
333008	Brammo Bay, Dunk Id., N. Queensland.....	E. J. Banfield.....	1

A specimen, determined by Prof. Johnston, is pale green, somewhat zoned, recalling Reeve's *L. ovalis* in form. The original description calls for a dark coppery yellow brown, as the name implies, but the color in some of the species of *Lingula* is a variable factor.

LINGULA JASPIDEA A. Adams.

Lingula jaspidea A. ADAMS, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 101, 1863.—DALL, Proc. Acad. Nat. Sci. Phila., for 1873, p. 177.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 218, pl. 28, figs. 23, 24a, 1888.

?*Lingula dumortieri* DAVIDSON, Proc. Zool. Soc., 1871, p. 310, pl. 30, fig. 3.—DUNKER, Index Moll. Maris Japonici, p. 254, 1882; not of Nyst, Coq. et Pol. fos. de la Belgique, p. 337, 1843.

Type locality.—Mososeki, Japan, in 7 fathoms, mud. A. Adams.

Cat. No.	Locality.	Collector.	Number of specimens.
127043	Japan.....	Rolle.....	2
124223	Enoshima, Japan.....	F. Stearns.....	4
128261	Japan.....	Herman.....	1
332781	Japan.....	Fulton.....	3

Valves mostly of a dark reddish brown, sometimes with a slight touch of green distally. The beaks are rather short.

LINGULA LEPIDULA A. Adams.

Lingula lepidula A. ADAMS, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 101, 1863.—
DAVIDSON, Proc. Zool. Soc., 1871, p. 311, pl. 30, fig. 4; Mon. Rec. Brach.,
pt. 3, p. 220, pl. 28, fig. 16, 1888.

Type-locality.—Seto Uchi, Akashi, Japan, in 10 fathoms, mud, A. Adams.

Cat. No.	Locality.	Collector.	Number of specimens.
109164	Yedo Bay, Japan.....	E. S. Morse.....	6
173632	Japan.....	Captain St. John...	1

This is a small yellowish-white species which looks externally much like *Glottidia albida*, but is less solid, and a true *Lingula*. Doctor Davidson regarded it as possibly the young of a larger species Professor Morse as a distinct form. A much larger series is required to settle all doubt.

LINGULA REEVII Davidson.

Lingula reevii DAVIDSON, *Challenger* Brachiopoda, p. 62, 1880; Mon. Rec. Brach.,
pt. 3, p. 219, pl. 28, figs. 17, 18a, 1888.

Lingula ovalis REEVE, Proc. Zool. Soc., 1841, p. 100; Conch. Icon. Mon. *Lingula*,
pl. 1, fig. 1, 1859. Not of J. Sowerby, Min. Conch., pl. 19, fig. 14, 1813.

Type locality.—Hawaiian Islands. Pease.

Cat. No.	Locality.	Collector.	Number of specimens.
17827	Hawaiian Islands.....	Pease.....	1

A thin, brilliantly colored, markedly ovate shell.

Genus GLOTTIDIA Dall.

Glottidia DALL, Amer. Journ. Conch., vol. 6, p. 154, 1870.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 221, 1888.

Type.—*Lingula albida* Hinds, 1844.

This genus takes the place in America that is occupied in Asia and Australasia by the genus *Lingula*.

GLOTTIDIA ALBIDA Hinds.

Lingula albida HINDS, Zool. Voy. *Sulphur*, Mollusca, p. 71, pl. 19, fig. 4, 1844.—

REEVE, CONCH. Icon. Mon. *Lingula*, pl. 1, fig. 4, 1859.

Glottidia albida DALL, Amer. Journ. Conch., vol. 6, p. 157, pl. 8, figs. 1-6, 1870.—

DAVIDSON, Mon. Rec. Brach., p. 221, pl. 28, figs. 2-4, 1888.

Type locality.—Magdalena Bay, Lower California, in 7 fathoms sandy mud. Hinds.

Cat. No.	Locality.	Collector.	Number of specimens.
19416	San Diego.....	Cooper.....	Figd.
193756	California.....	Miss Price.....	2
216713	Off Venice, Calif.....	Univ. of S. Cal.....	5
57374	San Pedro, Calif.....	Mrs. Bush.....	2
111040	San Pedro, Calif.....	Dr. Stearns.....	2
129293	San Pedro, Calif.....	Miss Shepard.....	10
111041	San Pedro, Calif.....	Mrs. Oldroyd.....	2
253011	San Pedro, Calif.....	J. White.....	3
173850	Catalina Island, Calif.....	Mrs. Trask.....	1
111039	Catalina Island, 10-15 fms.....	W. H. Dall.....	2
56741	San Diego, Calif.....	Dr. Stearns.....	2

Hinds's figure represents an adult specimen with only a portion of the original peduncle attached. The valves are nearly always more or less streaked with brown, especially on the sides where a pair of brown streaks are of frequent occurrence. The peduncle varies in length among individuals and is sometimes attached to a small pebble or bit of shell and in many cases entirely free or incased in an irregular sand tube. The most northern locality reported for the species is at Monterey Bay, California. A commensal *Crepidula* (*glottidiarum* Dall) often completely covers each valve.

GLOTTIDIA PALMERI Dall.

Glottidia (*albida* var.?) *palmeri* DALL, Amer. Journ. Conch., vol. 7, p. 77, 1871.

Glottidia palmeri DALL, Proc. Acad. Nat. Sci. Phila., for 1873, p. 204.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 222, pl. 28, figs. 5-6a, 1888.

Type locality.—Head of the Gulf of California. Dr. E. Palmer.

Cat. No.	Locality.	Collector.	Number of specimens.
219921	San Pedro, California.....	Mrs. Oldroyd...	23
83227	San Diego, California.....	Hemphill.....	3
267499	Concepcion Bay, Lower California.....	Bartsch.....	7
111041	Head of Gulf of California.....	Dr. E. Palmer..	2 cotypes.

My doubts as to the specific distinctness of this form from *G. albida* are not entirely removed, although the adults show some marked differences. Dr. Thomas Davidson, however, was of the opinion that they are distinct. He mentions the presence of a very similar species, *G. lesueuri* in the lower Silurian.

GLOTTIDIA AUDEBARTI Broderip.

Lingula audebardi BRODERIP, Trans. Zool. Soc., vol. 1, p. 143, pl. 23, fig. 14, 1835.—

G. B. SOWERBY, Thes., vol. 1, p. 338, pl. 67, fig. 5, 1847.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 377, 1852.

Lingula audebarti DESHAYES, Anim. s. Vert., vol. 7, p. 390, 1836.

Lingula audebardi KÜSTER, Conch. Cab. Lingula, p. 15, pl. 1, figs. 10-11, 1843.

Type locality.—Isle of Punam, Bay of Guayaquil, in 7 inches hard, sand, between tides. H. Cuming.

Cat. No.	Locality.	Collector.	Number of specimens.
107768	Topolobampo, western Mexico.....	Capt. J. D. Porter..	8

Owing doubtless to the condition in which Doctor Davidson's posthumous papers were left there is an extraordinary confusion in the synonymy of this species in the part of his monograph published after his death. The species is confused with *G. pyramidata* Stimpson, which is not only totally unlike *G. audebarti* specifically, but comes from a different zoological province. The reference under Sowerby should be to the Thesaurus and not to the Conchologia Iconica.

Glottidia audebarti is a large species with the umbonal half mostly white, the distal half of the valves painted with a brilliant blue green, unlike any other species in the genus. The spelling of the original name was corrected by Deshayes to agree with the correct spelling of the name of Baron d'Audebart de Ferussac, whom Broderip desired to honor.

GLOTTIDIA PYRAMIDATA Stimpson.

? *Lingula antillarum* REEVE, Conch. Iconica, Mon. *Lingula*, pl. 2, fig. 8, 1859. Martinique?

Lingula pyramidata STIMPSON, Amer. Journ. Sci. Arts, vol. 39, p. 444, 1860.—W. K. BROOKS, Sci. Res. Chesapeake Zool. Lab., vol. 1, pp. 35-112, pls. 1-6, 1879.

Glottidia pyramidata DALL, Amer. Journ. Conch., vol. 6, p. 158, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 204.—MORSE, Mem. Boston Soc. Nat. Hist., vol. 5, No. 8, pls. 30-32, 43-46, 47, 48, 1902.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 223, (ex parte) pl. 28, figs. 10, 11 (only), 1888.

Type locality.—Beaufort, North Carolina, at extreme low tide, not uncommon. Stimpson.

Cat. No.	Locality.	Collector.	Number of specimens.
32922	North Carolina.....	Stimpson	10
111038	Fort Macon, North Carolina.....	Doctor Yarrow.....	4
133921	North Carolina.....	.....	3
61804	West Coast Florida.....	F. B. Meek.....	10
36036	Cedar Keys, Florida.....	Hemphill.....	3
53852	Marco, Florida, 1. w. to 3 fms.....	Hemphill.....	2
145968	Tampa Bay, Florida.....	Dall.....	3
173636	Tampa Bay, Florida.....	Dall.....	2

For some time I suspected Reeve's shell to be identical with the North American species, but no subsequent collector has found the shell at Martinique, and none of the numerous specimens of *G. pyramidata* I have seen have the relative width of Reeve's figure or any touch of the green color he reports. I do not find that Cuming himself ever visited Martinique, and am now disposed to think his species was not really American. Cuming's localities, except for specimens of his own collecting, are notoriously unreliable.

Glottidia pyramidata is a small narrow whitish or horny shell, in most cases without calcareous matter enough to dry in normal shape. It has rarely a few brownish specks upon it but never shows any greenish color. Brooks, Morse, and Doctor Beyer have exhaustively described its anatomy and characteristics. As in most cases the southern specimens are larger and more solid than those from northern stations. It is believed to live not much over a year. It was found by Henderson at a depth of nearly two feet in the sand among roots of sea grasses.

Order NEOTREMATA.

Family CRANIIDAE.

Genus CRANIA Retzius.

Crania RETZIUS, Schrift. Berl. Ges. Naturf. Freunde, vol. 2, p. 72, 1781, type, *C. craniolaris* Linnaeus, fossil.

Crania DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 27, 1871; Proc. Acad. Nat. Sci. Phila. for 1873, p. 197.

CRANIA ANOMALA Müller.

Patella anomala MÜLLER, Prodr. Zool. Dan., p. 237, 1776.—Gmelin, Syst. Nat., vol. 2, p. 3721, 1792.

Orbicula norvegica LAMARCK, Système, p. 140, 1801.

Crania anomala SOWERBY, Conch. Man., ed. 2, p. 125, fig. 197a, 1842.—Lovén, Index Moll. Scand., p. 29, 1846.—DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 33, 1871 (full synonymy).—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 183, pl. 27, figs. 1-96, 1888.

Type locality.—Norway. Müller.

Cat. No.	Locality.	Collector.	Number of specimens.
111027	Shetland Islands.....	Jeffreys.....	5
14488	Scotland.....	McAndrew.....	3
11025	Oban, Scotland.....	Stimpson.....	16
334776	Oban, Scotland.....	Henderson.....	1
118362	Oban, Scotland.....	Stimpson.....	6
14188	Britain.....	Jeffreys.....	1
173760	Norway.....	Jeffreys.....	2
173761	Dröbach, Norway.....	Jeffreys.....	3
173762	Vallö, Norway.....	G. O. Sars.....	6
173763	Osterfiord, Norway.....	G. O. Sars.....	1
173733	Zetland.....	Jeffreys.....	12
173734	Zetland.....	Barlee.....	3
173735	Unsthaf, Shetlands.....	Jeffreys.....	4
173736	Unsthaf, Shetlands.....	Jeffreys.....	3
173737	Unsthaf, Shetlands.....	Jeffreys.....	3
173741	Unsthaf, Shetlands.....	Jeffreys.....	2
173738	Unsthaf, Shetlands.....	Jeffreys.....	13
173739	Shetlands.....	Jeffreys.....	1
173740	Shetlands.....	Jeffreys.....	10 yo.
173742	Off Lerwick, Shetlands.....	Jeffreys.....	9
173731	North of Scotland.....	Porcupine Exp.....	4
173732	North of Scotland.....	Porcupine Exp.....	1
173743	Oban, Scotland.....	Jeffreys.....	9
173744	Oban, Scotland.....	Jeffreys.....	3+
173751	The Minch, Hebrides.....	Jeffreys.....	2
173750	Ullapool, Hebrides.....	Jeffreys.....	3
173752	Skye.....	Jeffreys.....	1 yo.
173747	Loch Fyne, Scotland.....	Jeffreys.....	1
173748	Loch Alsh, Scotland.....	Jeffreys.....	2
173749	Loch Carron, Scotland.....	Jeffreys.....	9
173729	Figured Brit. Conch., vol. II.....	Jeffreys.....	1
173730	Figured Brit. Conch., vol. V.....	Jeffreys.....	1
173753	West of Ireland, Sta. 6.....	Porcupine Exp.....	2
173754	West of Ireland, Sta. 7.....	Porcupine Exp.....	2
173755	West of Ireland, Sta. 2.....	Porcupine Exp.....	1
173756	West of Ireland, Sta. 12.....	Porcupine Exp.....	5
173757	Cork Harbor.....	Jeffreys.....	4
173758	Larne.....	Jeffreys.....	4
173759	Belfast Bay.....	Jeffreys.....	6
173764	Cape Breton, France.....	Jeffreys.....	1
173765	West of Portugal.....	Porcupine Exp.....	1
173766	West of Finisterre.....	Porcupine Exp.....	1
173767	West of Finisterre, Sta. 3.....	Porcupine Exp.....	1

I follow recent authors in separating the Mediterranean form from that of the North Atlantic, though I have not material enough to enable me to form a decisive opinion of my own.

CRANIA LAMELLOSA Seguenza.

Crania lamellosa SEGUENZA, Pal. Mal. ter. terz. del distr. di Messina, p. 76, pl. 8, fig. 8, 1865.

Crania anomala var. *lamellosa* JEFFREYS, Proc. Zool. Soc., Apr. 1878, p. 414.

Type locality.—Coast of Tunis in 40 to 120 fathoms, for the recent form identified by Jeffreys.

Cat. No.	Locality.	Collector.	Number of specimens.
173778	Coast of Tunis.....	Shearwater Exp....	5 v.

I have not been able to compare the recent specimens in the Jeffreys collection with specimens of the fossil described by Seguenza, and insert this form under the above name entirely on the authority of Doctor Jeffreys. It seems, however, to agree sufficiently well with Seguenza's figures.

CRANIA KERMES Da Costa and Humphrey.

Patella kermes DA COSTA and HUMPHREY, Nat. Hist. of shells, pl. 1, fig. 10, 1770, (according to Davidson).

Crania personata BLAINVILLE, Dict. Sci. Nat., vol. 11, p. 312, pl. 304, fig. 2, 1818.—LAMARCK (ex parte), Anim. s. Vert., vol. 6, p. 238, 1819.—SOWERBY, Thes. Conch., p. 367, 1847.

Orbicula turbinata DESHAYES, Anim. s. Vert., ed. 2, vol. 7, p. 317, 1836.

Crania ringens HOENINGHAUS, Mon. Crania, p. 3, fig. 2, 1828.—DESHAYES, Anim. s. Vert., ed. 2, vol. 7, p. 302, 1836.—SOWERBY, Thes. Conch., p. 367, pl. 73, figs. 10–11, 1847.

Crania anomala var. *turbinata* DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 34, 1871.

Crania turbinata DAVIDSON, Mon. Rec. Brach., pt. 3, p. 188, pl. 27, figs. 14–23, pl. 28, figs. 1, 1a, 1888.

Type locality.—Sicily, Mediterranean Sea.

Cat. No.	Locality.	Collector.	Number of specimens.
173769	Soloom Bay, Tunis.....	Porcupine Exp....	30
173768	Sta. 45, coast of Morocco.....	Porcupine Exp....	2
173773	Off Sicily, 266 fathoms.....	Porcupine Exp....	5 v.
111026	Corsica.....	Jeffreys.....	2 v.
173772	Corsica.....	Susini.....	2
173771	Toulon.....	A. B.....	1
173775	Gulf of Naples.....	Zool. Sta.....	1
173776	Ægean Sea.....	Capt. Nares.....	4
173779	Ægean Sea.....	Edw. Forbes.....	1
173774	Bay of Naples.....	Tiberi.....	2 v.
173770	Adventure Bank.....	Jeffreys.....	5 v.
202085	Naples.....	Dohrn.....	2
131051	Mediterranean.....	I. Lea.....	1
173781	Mediterranean.....	Humphreys.....	1
173782	Mediterranean.....	Issel.....	1

The specific relations between the various Mediterranean *Cranias* require more thorough investigation.

CRANIA ROSTRATA Hoeninghaus.

Crania rostrata HOENINGHAUS, Mon. Crania, p. 3, plate, figs. 3 a–b, 1828.

Type locality.—Mediterranean, on corals.

Cat. No.	Locality.	Collector.	Number of specimens.
111028	Mediterranean.....	T. Davidson.....	1

Doubtfully distinct from the preceding species.

CRANIA HAWAIIENSIS, new species.

Lower valve pale buff, thin, more or less flexible, the shell substance somewhat radiately fibrous, the margins entire, not crenulated, the inner surface of the disk smooth except for the reproduced irregularities of the substratum, and the slight prominence of the muscular scars; there is no indication of a septum. Breadth 8 mm. length 8 mm. U. S. Nat. Mus. Cat. No. 335294.

Type locality.—Near Bird Island, Hawaiian group, at United States Bureau of Fisheries station 4158, in 20 to 50 fathoms, bottom temperature 78° 6, collected by the United States Steamer *Albatross*, one lower valve adhering to a specimen of *Peristernia crocea* Gray.

No species of *Crania* having been reported from the Hawaiian group, this specimen has a peculiar interest. I should have felt hardly justified in naming it from a single lower valve were it not that it differs from all the described species in its elasticity and fibrous texture and the almost entire absence of calcareous matter. A microscopic scrutiny of a large series of *Xenophora pallidula* in the hope of finding other individuals proved vain. It did reveal a minute specimen of *Discinisca* about two mm. in diameter, with short cirrhi, which, when an attempt to detach it was made, snapped into space and could not be found. This genus is also new to the islands. It came from station 4099, on the north coast of Maui in 152 fathoms, temperature 60° 7.

CRANIA PHILIPPINENSIS, new species.

Shell depressed, attached to a substratum by the whole surface of the lower valve, whitish internally, reddish brown externally, the apex of the upper valve prominent, the posterior margin straight, the general outline rounded-quadrate; upper surface irregularly lamellose, the lamellae not raised, but with small, threadlike, raised, radiating, sparsely distributed lines continuous only on the single lamella; interior of upper valve minutely granulose, with a margin defined by a raised inner ridge, not radiately sculptured, the pedestals of the adductors slightly raised, not coalescent medially, with a small prominence in the middle line just below them; the anterior spaces carry impressions of five or six brachial lobes on each side; the space behind the adductor ridges, with a central diamond-shaped depression the two scars above it not elevated, evenly rounded; interior of

lower valve shallow with a central prominence carrying anteriorly two irregular depressed scars, the posterior scars like those of the upper valve. Mesial diameter of lower valve 14; transverse diameter 19; vertical height of both valves about 5 mm.

Type locality.—Between Masbate and Leyte Islands, Philippines, in 114 fathoms, green mud, at Bureau of Fisheries station 5398.

Cat. No. 274128, Types, seven loose but partly fresh valves probably in part detached from material brought up in the dredge and then living.

The upper surface of this species is unlike that of any of the previously described forms and in other respects it is very distinct from the only other species found in this faunal area. It is much the largest of the tropical species now known.

CRANIA PATAGONICA Dall.

Crania patagonica DALL, Proc. U. S. Nat. Mus., vol. 24, No. 1264, p. 562, Mar., 1902; vol. 26, No. 1342, p. 950, pl. 62, figs. 1, 3; 1903.

Type locality.—West coast of Patagonia in 122 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
96913	Type	B. F.	1 v.
96921	Magellan Straits, 348 fathoms.....	B. F.	2 v.

The minute short spines with which the surface of the upper valve is covered distinguish it at once from any other recent species which has been reported up to the present time.

CRANIA POURTALESII Dall.

Crania anomala var. *pourtalesii* DALL, Bull. Mus. Comp. Zool., vol. 3, p. 35, pl. 1 figs. 7a-b, 1871.

Type locality.—Off the Samboes Reef, Florida Keys, in 116 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
111022	Off the Samboes (type)	Pourtales.....	1
111024	Off the Samboes.....	Pourtales.....	1 v.
61225	Campeche Bank, 200 fms	Doctor Rush.....	1
111023	Off Cuba in 226 fms	Pourtales.....	1

Genus CRANISCUS Dall.

Craniscus DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 27, May, 1871, type, *C. tripartita* Münster.—DAVIDSON, Mém. Soc. Linn. de Normandie, vol. 10, pl. 13, fig. 21, 1856.

In this group the mesial septum and the elevated ridges which sustain the adductors in the upper valve are so elevated that they divide the cavity of the valve into three compartments when adult. This characteristic is distinct but less emphatic in the only recent species yet described.

CRANISCUS JAPONICUS A. Adams.

Crania japonica A. ADAMS, Ann. Mag. Nat. Hist., vol. 11, p. 100, 1863.—DAVIDSON, Proc. Zool. Soc. 1871, p. 311, pl. 30, figs. 6, 6a; Mon. Rec. Brach., pt. 3, p. 191, pl. 27, figs. 10, 11, 1888.

Type locality.—Gotto Islands, Japan, in 71 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
173780	Gotto Islands, 71 fathoms.....	A. Adams.....	1 v.
110831	Kagoshima Gulf, 103 fathoms.....	B. F.....	1 v.
111300	Off Matocot Point, Philippine Islands, 170 fathoms.	B. F.....	2 v.
297300	Palawan Pass, Philippine Islands, 43 fathoms.	B. F.....	2 v.
294658	Off Burias, Philippine Islands, 105 fathoms...	B. F.....	15 v.
299597	Sibutu Gulf, Borneo, 162 fathoms.....	B. F.....	2 v.
?300352	Gulf of Boni, Celebes, 484 fathoms.....	B. F.....	1 v.

The septum in this species is short and, except in fully developed specimens, hardly elevated enough to markedly divide the anterior space. Another peculiarity of this species is that the lower valve is subconical and attached to its substratum only by the central apex instead of by its whole surface as in the typical *Crania*. In one specimen this attached tip shows a central depression, as if there might have been in the very young a peduncular orifice, but as all the specimens were loose valves, dead specimens when dredged, this is doubtful.

Family DISCINIDAE.

Genus DISCINA Lamarck.

Discina LAMARCK, Hist. Anim. s. Vert., vol. 6, p. 236, 1819.—DALL, Bull. Mus. Comp. Zool., vol. 3, pt. 1, p. 39, 1871.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 102, 1888.

Orbicula SOWERBY, Min. Conch., vol. 6, p. 4, pl. 506, 1830. Not of Lamarck, Système, p. 140, 1801.

DISCINA STRIATA Schumacher.

Crania (B) *striata* SCHUMACHER, Essai, p. 102, pl. 20, figs. 1 *a-f*, 1817 (not of DeFrance). No locality cited.

Crania radiosa GOULD, Moll. U. S. Expl. Exp., p. 465, figs. 480 *a-c*, 1852.

Orbicula norvegica SOWERBY, Trans. Linn. Soc., vol. 13, p. 468, pl. 26, fig. 2, 1822.

Discina ostreoides LAMARCK, An. s. Vert., vol. 6, p. 237, 1819; not of Turton, Dithyra Britannica, p. 238, 1822.

Orbicula evansii DAVIDSON, Proc. Zool. Soc., 1852, p. 81, pl. 14, figs. 32-34.

Type locality.—Cape Palmas, West Africa. Gould.

Cat. No.	Locality.	Collector.	Number of specimens.
5962	Cape Palmas (types).....	U. S. Expl. Exp....	3
173783	West Africa.....	Sowerby.....	3

Genus DISCINISCA Dall.

Discinisca DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 37, 1871, type, *D. lamellosa* Broderip.

DISCINISCA LAMELLOSA Broderip.

Orbicula lamellosa BRODERIP, Proc. Zool. Soc., 1833, p. 124; Trans. Zool. Soc., vol. 1, p. 142, pl. 23, fig. 2, 1835.

Discina lamellosa S. P. WOODWARD, Man. Moll., p. 336, figs. 160–162, 1856.

Discinisca lamellosa DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 41, 1871.—
DAVIDSON, Mon. Rec. Brach., pt. 3, p. 197, pl. 26, figs. 1–8, 1888.

Type locality.—Iquiqui, Bay of Ancon, Peru. Cuming.

Cat. No.	Locality.	Collector.	Number of specimens.
173629	Peru.....	Flower.....	1
173630	Peru.....	Jeffreys.....	1
110740	Off Peruvian coast 2,845 fathoms (dead).....	B. F.....	1 v.
17826	Callao, Peru, l. w.....	U. S. Expl. Exp....	Many.
131040	Arica, Peru.....	Chamberlain.....	10
102026	Callao, Peru.....	Stearns.....	4
217568	Peru.....	S. Smith.....	2
59568	Valparaiso, Chile.....	Stearns.....	2

The Disciniscas are naturally divided into three groups as follows:
A. Large, lamellose, flexible, without radiating sculpture. Examples: *D. lamellosa*, *D. laevis*.

B. Large, less lamellose, with feeble irregular radiations, more solid. Examples: *D. strigata*, *D. cumingi*.

C. Small, with regular radiating sculpture, not lamellose, solid. Examples: *D. stella*, *D. antillarum*.

Groups A and B are confined to the western coasts of the Americas; group C to the east coast of Asia and associated islands and the shores of the tropical Atlantic.

The discrimination of the species, especially if the valves are a little worn, is not always easy, but the outside sculpture of the lower valve and the form of the peduncular orifice afford excellent and easily recognizable characters. They have also the advantage of being less liable to wear and incrustation than the upper valves.

In the case of *D. lamellosa*, there is a very short groove at the center of the valve suggesting a closed central pedicel opening in the very

young; the base is evenly closely concentrically lamellose; the peduncular area is ovate-lanceolate, deeply impressed, with the opening narrow, elongate, close to the posterior margin and usually separated from it by a thin papyraceous narrow band which is in the majority of dry specimens broken away so that the orifice is not entire, but has the aspect of a sulcus. This species lives near low water and is often exposed in large masses at extreme ebb tides.

DISCINISCA LAEVIS Sowerby.

Orbicula laevis SOWERBY, Trans. Linn. Soc., vol. 13, p. 468, pl. 26, figs. 1 *a-d*, 1822.—REEVE, Conch. Icon., *Orbicula*, pl. 1, figs. 4 *a-b*, 1862.

Discinisca laevis DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 42, 1871; Amer. Journ. Conch., vol. 7, p. 76, 1871.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 195, pl. 26, figs. 1, 9, 10, 11; 1888.

Type locality.—Concepcion, Chile, in 6 fathoms. Cuming. The habitat of the original specimen was unknown, but the species was later found as above by Cuming.

Cat. No.	Locality.	Collector.	Number of specimens.
265794	Point Abreojos, Lower California.....	B. F.	3
111032	Point Abreojos, Lower California.....	Hemphill.....	10
111029	Ipolito Point, Lower California.....	Capt. Porter.....	3
37248	No locality.....	.....	2 v.
15826	Cape San Lucas, Lower California.....	Xantus.....	4 v.
61364	Gulf of California.....	Mex. Comm.....	1
264856	Sta. Maria Bay, Gulf of California.....	B. F.	14
122840	Panama.....	B. F.	1
207698	Ancon Bay, Peru.....	Peruvian Govt.....	4
17824	Peru.....	H. Cuming.....	1 v.

This species has a rather prominent central septum on the inside of the lower valve. The exterior of this valve is well figured by Reeve (fig. 4b), having low arcuate lamellae starting from the peduncular large depressed area and surrounded by a marginal band of concentric lamellae. The foramen is narrow and not so near the margin as that of *D. lamellosa*. Davidson's figure 9 is a poor copy of Reeve; the base shown in figure 11 of Davidson's plate 26, is that of *D. lamellosa* and not *D. laevis*. The posterior extremes of the horny part of the valve meet but do not coalesce behind the peduncular area.

DISCINISCA STRIGATA Broderip.

Orbicula strigata BRODERIP, Trans. Zool. Soc., vol. 1, p. 143, pl. 23, fig. 1, 1833.

Orbicula cumingi REEVE, Conch. Icon., *Orbicula*, fig. 6, 1862; not of Broderip.—

DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 276, 1852.

Discinisca strigata DALL, Bull. Mus. Comp. Zool., vol. 3, p. 42, 1871.

Discinisca cumingi DAVIDSON, Mon. Rec. Brach., pt. 3, p. 292, 1888, *ex parte*.

Type locality.—Cana Island, Guatemala, 18 fathoms. Cuming.

Cat. No.	Locality.	Collector.	Number of specimens.
130567	San Pedro, California.....	I. Shepard.....	1
129284	San Diego, California.....	Hemphill.....	1
111030	Margarita Bay, Lower California.....	Porter.....	2
111031	Magdalena Bay, Lower California.....	Nichols.....	2 v.
217829	Magdalena Bay, Lower California.....	Orcutt.....	8 v.
41588	Mazatlan, Mex.....	Carpenter.....	1
15372	Realejo.....	.....	1
101942	Nicaragua.....	Stearns.....	1
3859	Panama.....	.....	1

This species is quite distinct from *D. cumingi* with which it has generally been confused. The California specimens above cited are probably adventitious, from scrapings of small coasting craft doing business to the southward. When fresh the radial stripes of dark color distinguish it sharply from any other species of the genus, but these gradually fade out in the cabinet. The texture is much more calcareous than that of any other west American species. The surface of the upper valve is quite regularly radiately threaded, especially in the young. The horny part of the lower valve is continuous behind the peduncular area, which is very large, the surface of the valve about it is regularly radiately striated. In old specimens the striation is obsolete or absent on the peripheral part of the upper valve, and the surface is apt to be quite irregular.

DISCINISCA CUMINGII Broderip.

Orbicula cumingii BRODERIP, Proc. Zool. Soc., 1833, p. 124; Trans. Zool. Soc., vol. 1, p. 143, pl. 23, fig. 1, 1833.

Discinisca cumingii DALL (*strigata* excl.), Bull. Mus. Comp. Zool., vol. 3, p. 42, 1871; Amer. Journ. Conch., vol. 7, p. 76, 1871; Proc. Acad. Nat. Sci. Phila. for 1873, p. 201.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 202, pl. 26, figs. 23 to 25 (fig. 26 excl.), 1888.

Type locality.—Payta, Peru, in 6 fathoms. Cuming.

Cat. No.	Locality.	Collector.	Number of specimens.
16012	Acapulco, Mexico.....	Dr. Newberry.....	1 v.
216281	Panama.....	J. Zetek.....	3 v.
17826c	Callao, Peru.....	U. S. Expl. Exp...	1 v.
41845	Callao, Peru.....	U. S. Expl. Exp...	1 v.

This is a thinner and more distinctly reticulated species than *D. strigata*, without dark blackish radial stripes, and less calcareous. The basal valve has a large peduncular area, which is figured by Davidson. The sculpture outside of the area is concentrically lamellose with faint radial striae, according to Broderip and Davidson. The Museum specimens are all upper valves.

DISCINISCA ANTILLARUM Orbigny.

Orbicula antillarum ORBIGNY, Moll. Cuba, p. 368, pl. 28, figs. 34-36, 1846.—REEVE, Conch. Icon., *Orbicula*, pl. 1, fig. 2, 1862.

Discinisca antillarum DALL, Bull. Mus. Comp. Zool., vol. 3, p. 42, 1871; Proc. Acad. Nat. Sci. Phila. for 1873, p. 201.—DAVIDSON, Mon. Rec. Brach., pt. 3, 204, pl. 26, fig. 31, 1888.

Type locality.—Cuba, on coral. Orbigny.

Cat. No.	Locality.	Collector.	Number of specimens.
64335	Jamaica.....	C. B. Adams.....	3
185369	Nicaragua.....	W. H. Fluck.....	3
160694	Goyanna, Brazil.....	J. C. Branner.....	1

Peduncular area large, heart shaped, the valve outside of it finely radiately threaded. The upper valve is rather sparsely radiately threaded, generally with a smooth apex and irregular concentric sculpture. The apex is usually rather posterior.

DISCINISCA STELLA Gould.

Discina stella GOULD, Proc. Boston Soc. Nat. Hist., vol. 7, p. 324, 1860; Otia Conch., p. 120, 1865.

Orbicula stella REEVE, Conch. Icon. *Orbicula*, pl. 1, fig. 1, 1862.

Discinisca stella DALL, Bull. Mus. Comp. Zool., vol. 3, p. 41, 1871; Proc. Acad. Nat. Sci. Phila. for 1873, p. 202.—DAVIDSON (*ex parte*), Mon. Rec. Brach., pt. 3, p. 204, pl. 26, figs. 27, 27a, 30, 1888.

Type locality.—China Seas, Hongkong. Stimpson.

Cat. No.	Locality.	Collector.	Number of specimens.
1759	Hongkong (type).....	W. Stimpson.....	3
175724	Fukura, Awaji, Japan.....	Hirasé.....	3 v.
175611	Hirado, Iizen, Japan.....	Hirasé.....	4 v.
228121	Nagasaki, Japan.....	Univ. Tokio.....	1 v.
228123	Gulf of Tokio, Japan.....	Univ. Tokio.....	1
227260	Yenoshima, Japan.....	Univ. Tokio.....	2
217319	Pai-tai-ho, N. China.....	A. Sowerby.....	1 v.

Davidson has confused this species with the next. *D. stella* has much the same sculpture as *D. antillarum*, but coarser and tending to papillosity at the intersections of the radial and the concentric sculpture on the upper valve, which has a subcentral apex. The peduncular area is large, heart shaped, and the surface of the valve outside of it finely sharply closely radially threaded. The setae are short, seldom more than just visible outside the shell in dry specimens.

DISCINISCA SPARSELINEATA, new species.

Discinisca stella DAVIDSON (*ex parte*) Mon. Rec. Brach., pt. 3, p. 204, pl. 26, figs. 28, 28a, 1888.

Upper valve irregular, nearly without radial sculpture; pale yellow; lower valve with very large heart-shaped peduncular area with sparse, widely separated, fine radial threads outside of it. Setae very long, especially in front, nearly as long as the shell; apex of the upper valve at the posterior third in normal specimens, which have the posterior edge nearly straight. Diameter up to 9 mm., height 3 mm.

Type.—Cat. No. 274131, U.S.N.M.

Cat. No.	Locality.	Collector.	Number of specimens.
274129	Hakodate, Japan.....	W. Stimpson.....	1
274130	Fukura, Awaji, Japan.....	Hirasé.....	2 v.
274131	Gulf of Tokio, Japan (type).....	Univ. Tokio.....	1

DISCINISCA INDICA, new species.

Shell of variable color, generally pale straw color, the surface of the upper valve with fine radial threads delicately reticulated by concentric elevated lines; the setae very short, lower valve with large rounded peduncular area, the valve around it with sparse arcuate radial threads; the apex subcentral, the initial portion smooth. Normal form rounded, about 11 mm. in diameter and 3 mm. high.

Cat. No.	Locality.	Collector.	Number of specimens.
90305	Bombay (types).....	Wesleyan Univ	10
89897	Ceylon.....	Stearns Coll.....	2 v.

This species is not unlike *D. sparselineata*, but with feebler and finer sculpture and short setae. In some of the specimens fine concentric striae cut the distal portions of the basal radii. The following specimens from the Philippines may belong to *D. indica*, but only upper valves are available, so their relations must remain doubtful:

Cat. No.	Locality.	Collector.	Number of specimens.
240075	Philippines.....	Bureau Fisheries...	2 v.
229157	North of Corregidor Island, Manila Bay, 37 fathoms.....	Bureau Fisheries...	3 v.
229747	North of Corregidor Island, 28 fathoms.....	Bureau Fisheries....	1 v.
229953	South of Verde Island, 180 fathoms.....	Bureau Fisheries....	1 v.

Genus PELAGODISCUS Dall.

Pelagodiscus DALL, Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 440, 1908.—ALLAN THOMSON, Australasian Antarctic Exp., *Brachiopoda*, pp. 38, 40, 50, 1918.

Type.—*Discina atlantica* King. Abyssal.

This form has the peduncular area relatively large and the lower valve outside of it smooth as well as the upper valve. The setae are remarkably long and minutely prickly.

PELAGODISCUS ATLANTICUS King.

Discina atlantica KING, Proc. Nat. Hist. Soc. Dublin, vol. 5, pp. 170-73, 1868.—JEFFREYS, Ann. Mag. Nat. Hist., ser. 4, vol. 18, p. 252, 1876; *Challenger* Brach., p. 62, 1880.

? *Discinisca atlantica* DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 261.—DAVIDSON, Mon. Rec. Brach., pt. 3, p. 200, pl. 26, figs. 18-22, 1888.

Pelagodiscus atlanticus DALL, Bull. Mus. Comp. Zool., pt. 43, No. 6, p. 440, 1908.—ALLAN THOMSON, Australasian Antarctic Exp., *Brachiopoda*, pp. 38, 40, 50, 1918.

Type locality.—North Atlantic Ocean in 1,366 fathoms at station 19a, *Porcupine* Expedition of 1869.

Cat. No.	Locality.	Collector.	Number of specimens.
111033	North Atlantic, 2,100 fathoms	Jeffreys.....	1
183620	North Atlantic.....	J. Murray.....	1
173621	Station 12, <i>Valorous</i> Exp.....	Jeffreys.....	6
173622	Station 13, <i>Valorous</i> Exp.....	Jeffreys.....	1
173628	Station 17, <i>Valorous</i> Exp.....	Jeffreys.....	1
130339	Off the Azores, 2,995 fathoms	Talisman.....	1
52164	Southeast of Georges Bank, 1,356 fathoms.....	B. F.....	1
52165	Southeast of Georges Bank, 1,679 fathoms.....	B. F.....	2
52166	East of Georges Bank, 1,710 fathoms.....	B. F.....	1 v.
38429	Off Nantucket shoals, 1,467 fathoms.....	B. F.....	2
78720	Southwest of Nantucket shoals, 1,825 fathoms.....	B. F.....	2
111034	Off Marthas Vineyard, 1,853 fathoms.....	B. F.....	1
35170	Off Marthas Vineyard, 1,451 fathoms.....	B. F.....	7
44969	Off Marthas Vineyard, 1,525 fathoms.....	B. F.....	4
46147	Off Marthas Vineyard, 1,582 fathoms.....	B. F.....	2
78722	Off Maryland, 1,631 fathoms.....	B. F.....	1
108214	Off Fernandina, Florida, 294 fathoms.....	B. F.....	2

This has also been obtained off the Galapagos Islands and off Valparaiso, Chile, in the Pacific, and is the most cosmopolitan brachiopod known.

Order PROTREMATA.

Family THECIDIIDAE.

Genus THECIDEA Defrance.

Thecidea DEFRANCE, in Ferussac, Tableau Syst., p. XXXVIII, 1822 (nude name).—BRONGNIART, in Cuvier, Ossem. foss., ed. 2, vol. 2, pt. 2, p. 325, 1822.—BLAINVILLE, Man., vol. 1, p. 513, 1825.—DESHAYES, Dict. Class. d'hist. Nat., vol. 16, p. 215, Oct., 1830.

Thecidium SOWERBY, Gen. Shells, fasc. 20, Nov. 1823.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 156, 1887.

Thecidea RISSO, Hist. Nat. Eur. MÉR., vol. 4, p. 593, 1826.—DEFRANCE, Dict. Sci. Nat., vol. 53, p. 434, 1828.

Type.—*T. radians* Defrance, Cretaceous, Maëstricht.

The synonymy of this genus has been left in a confused state by authors and the tracing of citations to their source has revealed a number of errors which have been extensively copied. Fischer states in his Manuel, (page 1330), "Le genre *Thecidea* crée nominalement par Defrance en Ferussac, 1819, n'a été caractérisé qu'en 1822 dans le dictionnaire classique d'histoire naturelle; le même année, Brongniart cite comme type le *Thecidea radians*." This is not quite exact. The true history of the name is as follows:

Thecidea occurs as a nude name in Ferussac's Tableau. Brongniart in his description of the chalk of the hill of Maëstricht (taken chiefly from the work of Faujas de Saint Fond on that locality, published in 1799) cites four fossils of which the second and third are *Thecidea radians* and *hieroglyphica* of Defrance. There is no reference to either in the text, but after the first name is a reference to Faujas' figure 8 of his plate 17. This of course in conformity with modern usage fixed the genus and the type. Probably in ignorance of this citation, Ferussac in the Dictionnaire Classique in 1822, referred to the genus, under the article Brachiopodes, only by its vernacular name and as "non encore décrit" (p. 47). In this publication it is only in 1830, that Deshayes latinizes the name and diagnoses the genus. Also Sowerby in 1823, while at Doctor Goodall's recommendation correcting the unpublished name to *Thecidium*, states that he does not name the figured recent species because he "will not interfere with Defrance's unpublished account of the genus."

Thus it is clear that the name of Defrance circulated among his colleagues and correspondents several years before it was formally described and it is only by the accident of the citation of Faujas' figure by Brongniart, that the name is preserved in its original form.

The *Thecidea radians* Defrance, according to Bronn is a synonym of *Terebratulites papillatus* Schlotheim, 1813, and was later the *T. pumila* of Lamarck but not of Sowerby. The type of the genus therefore is *Thecidea papillata* (Schlotheim) from the Cretaceous of Maëstricht.

The recent forms differ sufficiently from the fossil type to have been separated as follows by Munier Chalmas.

Subgenus LACAZELLA Munier Chalmas.

Lacazella MUNIER CHALMAS, Bull. Société Géologique de France, ser. 3, vol. 8, 1880, vol. 1, p. 279, Feb., 1880 (?=*Thecidium* Sowerby, 1823).

LACAZELLA MEDITERRANEA Risso.

Thecidium (sp. not named) SOWERBY, Genera of Sh., fasc. 20, fig. 6, Nov., 1823.

Thecidea mediterranea RISSO, Hist. Nat. Eur. Mérid., vol. 4, p. 394, fig. 183, 1826.—DEFRANCE, Dict. Sci. Nat., vol. 53, p. 434, 1828.

Thecidea spondylea SCACCHI, Cat. Conch., p. 8, pl. 1, figs. 7-9, 1836.

Thecidium mediterraneum DAVIDSON, Mon. Rec. Brach., pt. 2, p. 156, pl. 23, figs. 12-22, 1887.

Type locality.—Mediterranean, near Nice.

Cat. No.	Locality.	Collector.	Number of specimens.
173595	Mediterranean.....	McAndrew.....	3
11888	Mediterranean.....	Damon.....	1
110967	Mediterranean.....	Dall.....	1
274154	Mediterranean.....	Webb.....	3
173597	Coast of Tunis.....	Capt. Nares.....	3
173598	Bay of Naples.....	Stephanis.....	2
173599	Bay of Naples.....	Issel.....	4
173600	Bay of Naples.....	Acton.....	2
17818	Sicily.....	Alder.....	1
173594	Port Vendres.....	Peuchinat.....	15
173596	Adventure Bank, 40-20 fathoms.....	Carpenter.....	1

A careful comparison of all the specimens available has enabled me to add something to Davidson's description of the interior of this species.

The cavity of the beak in the attached valve in fully-developed specimens shows a median septum supporting on each side an excavated plate which anteriorly projects more or less beyond the septum in a prong or point. In some specimens the septum only appears deep in the valve; in others it is prominent at the commissure between the plates and rises between them as a keel. In the fullest development of the arrangement the septum rises to the upper vault of the beak, thus dividing the cavity, in combination with the plates ("coques" of Lacaze Duthiers), into four compartments. The space between the forward prolongation of the plates is not deep, but triangular, and in none of the specimens which I have examined have I seen anything resembling the squarish or bilobed plate figured by Davidson (pl. 23, fig. 14 and fig. 15*b*). I presume in these cases the prongs have been broken off. One of the characters used by Allan Thomson to separate his *Thecidellina* from *Lacazella* is the presence of prongs in the former, but, as above stated, the prongs are quite evident in any well-preserved specimen of the type of *Lacazella mediterranea*.

LACAZELLA MAURITIANA, new species.

This species has a remarkable resemblance to the preceding, with which it has been confounded, but differs by having in the apical cavity of the attached valve instead of a platform supported by a septum, only two long, slender, excavated, upturned processes completely isolated medially, with no sign of a septum. The outer surface is minutely regularly granular. In other respects it agrees closely with *L. mediterranea*.

Cat. No.	Locality.	Collector.	Number of specimens.
173593	Mauritius.....	Sir H. Barkly.....	1

Type.—Cat. No. 173593, U.S.N.M.

Subgenus THECIDELLINA J. Allan Thomson.

Thecidellina J. ALLAN THOMSON, Geol. Mag., n. s., dec. 6, vol. 2, No. 616, p. 462, 1915. *T. barretti* Davidson.

This differs chiefly from *Lacazella* by its more simple arrangement of the brachia and their supports.

THECIDELLINA BARRETTI Davidson.

Thecidium barretti DAVIDSON, Geol. Mag., 1864, vol. 1, p. 17, pl. 2, figs. 1, 2, 3.—CROSSE, Journ. de Conchyl., vol. 14, 1866, p. 272.

Type locality.—Jamaica, West Indies.

Cat. No.	Locality.	Collector.	Number of specimens.
64235	Off Montserrat, 86 fathoms.....	Blake Exp.....	3
64236	Off the Grenadines, 163 fathoms.....	Blake Exp.....	1
336900	Off Cuba, 100–150 fathoms.....	Henderson.....	14

THECIDELLINA MAXILLA Hedley.

Theidea maxilla HEDLEY, Mem. Austr. Museum, vol. 3, pt. 8, p. 508, fig. 37, July, 1899.

Type locality.—Funafuti atoll, Ellice Islands, in 40 to 80 fathoms on corals. Charles Hedley.

Cat. No.	Locality.	Collector.	Number of specimens.
162264	Funafuti.....	Hedley.....	3

THECIDELLINA BLOCHMANNI, new species.

Shell ovate, white, solid, rudely concentrically sculptured externally, the lower valve attached by the apex, the area of the beak flat, with no indication of a pseudodeltidium; the interior finely granulose; the apex being broken off, the characters of the cavity of the beak are unknown, but in what is left there is no indication of a septum; the upper valve is rounded, its inner margin conspicuously granulose; the septum is strong, straight, grooved above, its posterior end tubular, opposite two small holes in the "bridge" lamella; anteriorly the edges of the septum round evenly into the sharp ridge which surrounds the brachial furrows in a nearly circular uninterrupted keel with serrate edge; the kidney-shaped area on each side of the septum is separated from it by a shallow groove; the area thus enclosed has in each case a deep pit posteriorly, and anteriorly is filled with irregularly disposed prominent unequal rounded pustules; the cardi-

nal process is squarish, with an internal medial keel where the septum is prolonged, and above it, in the "bridge", the two rounded holes before referred to. Length of lower valve about 6.5 mm.; transverse diameter 4.25 mm.; vertical diameter about 3.0 mm. Cat. No. 227822, U.S.N.M.

Type locality.—Christmas Island, collected by Mr. Anderson and forwarded to the Museum by Professor Blochmann of Tubingen, Germany. One specimen.

This is nearest to *T. maxilla* but is much more regular, the internal arrangements symmetrical, bilaterally identical, and elegant.

Order TELOTREMATA.

Family RHYNCHONELLIDAE.

Genus HEMITHYRIS Orbigny.

Hemithyris ORBIGNY, Pal. Franc. Ter. Crét., vol. 4, p. 342, 1847.

Hemithyris DALL, Amer. Journ. Conch., vol. 7, p. 70, 1871; Proc. Acad. Nat. Sci. Phila. for 1875, p. 196.

Rhynchonella DAVIDSON, Mon. Rec. Brach., pt. 2, p. 163, 1887.

Type.—*Anomia psittacea* Gmelin.

HEMITHYRIS PSITTACEA Gmelin.

Anomia psittacea GMELIN, Syst. Nat., vol. 2, p. 3348, 1792.

Hemithyris psittacea ORBIGNY, Pal. Franc. Ter. Crét., vol. 4, p. 342, 1847.

Hypothyris psittacea FORBES and HANLEY, Brit. Moll., vol. 2, p. 346, pl. 57, figs. 1-3, 1853.—KING, Ann. Nat. Hist., vol. 18, p. 238.

Rhynchonella psittacea REEVE, Conch. Icon., *Rhynchonella*, pl. 1, figs. 2 a-c, 1861.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 163, 1887.

Type locality.—Mari Groenlandiae; Gmelin.

Cat. No.	Locality.	Collector.	Number of specimens.
ATLANTIC HEMISPHERE.			
173692	Figured specimen. Jeffreys Brit. Conch., vol. 5, pl. 99, fig. 4.	.....	.....
173693	Figured specimen. Jeffreys Brit. Conch., vol. 5, pl. 8, fig. 2.	.....	.....
173708	Arctic Sea.....	Belcher.....	7
173710	Greenland, station 4.....	Valorous Exp.....	6
173712	Greenland, station 5.....	Valorous Exp.....	10
173713	Greenland, Franklin Pierce Bay.....	Valorous Exp.....	1
173714	Greenland, Holsteinborg.....	Valorous Exp.....	3
173726	Greenland, Holsteinborg.....	Valorous Exp.....	20
173717	Greenland, Holsteinborg.....	Copenhagen Mus.....	2
181190	Greenland, Ungsuak.....	McLain.....	1
111013	Greenland, Upernavik, 13 fathoms.....	McLain.....	1
224514	Greenland, Upernavik.....	McLain.....	1
111014	Greenland.....	McLain.....	2
181263	Greenland, off Hare Id., 90 fathoms.....	McLain.....	7
75347	Greenland.....	Mörch.....	1

Cat. No.	Locality.	Collector.	Number of specimens.
21910	Greenland.	Mörch.	1
173704	Spitsbergen, Loom Bay.	Eaton.	4
173705	Spitsbergen.	Torell.	1
226059	Franz Josef Land.	Ziegler.	1
152571	Murman coast.	Hertzenstein.	3
173706	Norway, Finmark.	Sars.	2
173707	Norway, Bergen.	Koren.	1
13978	Norway.	Sars.	7 v.
173709	Norway (deformed).	Sars.	3
173694	Shetlands, Unsthafe.	Jeffreys.	1
173695	Shetlands (young).	Jeffreys.	1
173697	Hebrides.	Jeffreys.	1
131049	Orkneys.	Mrs. Corrie.	1
173699	Northumberland coast.	Jeffreys.	1
173721	"Australia" (?).	Flower.	1
34387	Labrador, 8 fathoms.	W. A. Stearns.	3
173718	Labrador, Hopedale.	Packard.	3
34388	Labrador, Henley Harbor.	W. A. Stearns.	2
173719	Gulf of St. Lawrence.	Whiteaves.	2
50611	Off Newfoundland, 89 fathoms.	B. F.	1 v.
111015	Gulf of St. Lawrence.	Whiteaves.	1
203215	Off Halifax, N. S., 20 fathoms.	B. F.	1 v.
111016	Gulf of St. Lawrence.	Stimpson.	1
49392	Off Nova Scotia, 25 fathoms.	B. F.	1
173720	Gaspé Bay, Canada.	Whiteaves.	1
22751	Gaspé Bay, Canada.	Whiteaves.	5
173698	Murray Bay, Canada.	Dawson.	8
111017	"New England" (Maine ?).	Stearns.	2
49391	Gulf of Maine, 75 fathoms.	B. F.	3 v.
202875	Georges Banks, 45 fathoms.	B. F.	1
PACIFIC HEMISPHERE.			
110983	Seahorse Islands, Arctic Ocean, 25 fathoms.	E. E. Smith.	12
33808	Pt. Belcher, Arctic Ocean.	Dall.	1
33804	Off Cape Sabine, Arctic Ocean, 3 fathoms.	Dall.	1 v.
33805	Off Cape Sabine, Arctic Ocean, 3 fathoms.	Dall.	1 v.
33807	Off Icy Cape, Arctic Ocean.	Dall.	1
33803	Off Cape Lisburne, Arctic Ocean.	Dall.	11
180968	Kotzebue Sound, Arctic Ocean.	Washburne.	1
223411	Kotzebue Sound, Arctic Ocean.	U. S. Corwin.	1
203835	Fischscholtz Bay, Arctic Ocean.	Kindle.	3 v.
33806	Point Spencer, Bering Strait.	Dall.	1
110984	Cape Prince of Wales, 23 fathoms.	E. E. Smith.	7
223331	Bering Strait, 17 fathoms.	Dall.	2
223118	Bering Strait, 13 fathoms.	Dall.	2 v.
209784	Bering Strait.	Turner.	1
223302	Plover Bay, 20-25 fathoms.	Dall.	1
61279	Plover Bay.	Krause.	1
210759	Bering Sea.	U. S. Corwin.	4
210937	Bering Island.	Grebniatsky.	4
173721	Japan.	Capt. St. John.	1
210836	St. Paul Island.	W. Palmer.	4
151612	St. Paul Island.	Kincaid.	4 v.
215076	St. Paul Island.	G. D. Hanna.	3 v.
110990	St. Paul Island, 9 fathoms.	Dall.	3
110991	St. George Island.	Dall.	2 v.
110985	Nunivak Island, 9 fathoms.	Dall.	15
110987	Nunivak Island.	Dall.	7
110889	5 miles west of Nunivak, 24 fathoms.	Dall.	2
160943	Hagmeister Island, 8-15 fathoms.	Dall.	1 v.
110992	Attu Island, Saranna Bay.	Dall.	2

Cat. No.	Locality.	Collector.	Number of specimens.
205905	Petrel Bank, Bering Sea, 54 fathoms	B. F.	1
110993	Small Pass, Kyska Island, 10 fathoms	Dall	2
110994	Kyska Harbor	Dall	2 v.
225486	Atka Island	Dall	3
110995	Amchitka Island, 10 fathoms	Dall	1
160999	Amchitka Island	Dall	1 v.
110996	Unalashka Island, 70 fathoms	Dall	4
110999	Unalashka Island, 16 fathoms	Dall	5
110998	Iliuliuk Harbor, 5 fathoms	Dall	2
111000	Iliuliuk Harbor, 15 fathoms	Dall	10
110997	Iliuliuk Harbor, 25 fathoms	Dall	6
160908	Port Levasheff	Dall	1
111001	Akutan Pass	Dall	6
111004	Coal Harbor, Unga Island	Dall	12
111002	Coal Harbor, Unga Island, 8 fathoms	Dall	2
111003	Coal Harbor, Unga Island, 1. w.	Dall	4
111005	Coal Harbor, Unga Island, 8-9 fathoms	Dall	3
210802	Popoff Strait	Dall	1 v.
223223	Popoff Strait	Dall	9
111007	Nagai Island	Dall	2
111006	Yukon Harbor, 13 fathoms	Dall	3
111008	Simeonoff Island	Dall	1 v.
111009	Semidi Islands, 20 fathoms	Dall	1
111010	Chirikoff Island, 9-14 fathoms	Dall	4
222596	Chignik Bay, 60 fathoms	Dall	1
206411	Southeast of Alaska Peninsula, 21 fathoms	Dall	1
222158	Afognak Bay, 16 fathoms	Dall	1
110988	Kodiak Island	Dall	2 v.
206470	Kodiak Island	Fisher	1
209766	Kodiak, St. Paul	Fisher	20
55781	Kodiak	Fisher	12
224444	Kodiak	B. F.	3
111011	Kodiak, St. Paul, 13 fathoms	Dall	3
111012	Kenai, Cooks Inlet	Dall	2
223581	Dundas Bay, Alaska, 10 fathoms	B. F.	3
11780	Sitka Harbor, 1. w.	Dall	20
74232	Sitka Harbor	Hepburn	1
274132	Turn Island, Gulf of Georgia	Oldroyd	1
224351	Puget Sound, 40 fathoms	B. F.	6
126076	Astoria, Oregon	White	1

The specimens are in general very uniform. No. 215076, however, is nearly as coarsely striated and ribbed as the New Zealand *H. nigricans*. The largest specimen, No. 6279, measures: width, 30, length 32, and diameter 22 mm.

HEMITHYRIS NIGRICANS Sowerby.

Terebratulina nigricans SOWERBY, Proc. Zool. Soc., 1846, p. 91; Thes. Conch., vol. 1, p. 342, pl. 71, figs. 81, 82, 1847.

Rhynchonella nigricans DALL, Amer. Journ. Conch., vol. 6, p. 152, fig. 34, 1870.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 169, pl. 24, figs. 16-19, 1887.

Rhynchonella nigricans var. *pyxidata* WATSON, (in Davidson) *Challenger* Brach., p. 59, pl. 4, fig. 14, 1880.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 170, pl. 24, fig. 20, 1887.

Hemithyris nigricans DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 196.

Type locality.—New Zealand.

Cat. No.	Locality.	Collector.	Number of specimens.
173722	New Zealand.....	Flower.....	1
17819	New Zealand.....	Cuming.....	1
98954	New Zealand.....	Kershner.....	7 v.
102760	New Zealand.....	Stearns.....	2
11894	Lyall Bay, New Zealand.....	Col. Mus.....	8 v.
11894a	Sinclair Head, New Zealand.....	Col. Mus.....	8
111018	Stewart Island, New Zealand.....	C. Traill.....	11
111019	Bluff Head, New Zealand.....	Kershner.....	7 v.

This well known species though frequently distorted, when normally developed is very uniform.

HEMITHYRIS DÖDERLEINI Davidson.

Rhynchonella döderleini DAVIDSON, Ann. Mag. Nat. Hist., ser. 5, vol. 17, p. 1, 1886; Mon. Rec. Brach., pt. 2, p. 172, fig. 19, pl. 25, figs. 14-15, 1887.

Type locality.—Sagami Bay, Japan, in 160 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
297084	China Sea, off Pratas Island., 340 fms.....	B. F.....	1 v.
296984	China Sea, off Pratas Island., 230 fms.....	B. F.....	3 v.
299761	Sibuko Bay, Borneo, 347 fms.....	B. F.....	2 v.

It is to be regretted that the Bureau of Fisheries explorations resulted in obtaining only separated valves of this interesting species, though they largely extended its known geographic range. It seems to be most nearly related to the preceding species which is often imbricated.

HEMITHYRIS LUCIDA Gould.

Rhynchonella lucida GOULD, Proc. Boston Soc. Nat. Hist., vol. 7, p. 323, 1860; Otia Conch., p. 120, 1862.—DAVIDSON, Proc. Zool. Soc., 1871, p. 309, pl. 31, figs. 13-14; Mon. Rec. Brach., pt. 2, p. 168, pl. 24, figs. 14-15 b, 1887.

Hemithyrus lucida DALL, Proc. Acad. Nat. Sci. Phil. for 1873, p. 196.

Type locality.—Off Japan coast at latitude 30° 35' N. and longitude 130° 40' east, in 110 fathoms. Captain Stevens.

Cat. No.	Locality.	Collector.	Number of specimens.
111083	Hakodate, Japan.....	E. S. Morse.....	60
110827	Hakodate, Japan, 47 fathoms.....	B. F.....	2
110828	Eastern Sea, Japan, 139 fathoms.....	B. F.....	1 v.
211076	Japan Sea, 44 fathoms.....	B. F.....	30
110826	Kagoshima Gulf, 103 fathoms.....	B. F.....	10
274133	Otaru, Japan.....	Morse.....	2

The color of this species varies from light grey to dark slate color.

HEMITHYRIS CRANEANA Dall.

Hemithyris craneana DALL, Proc. U. S. Nat. Mus., vol. 17, p. 717, pl. 31, figs. 5-6, July, 1895.

Type locality.—Off Cocos Island, Gulf of Panama, at Bureau of Fisheries station 3362, in 1,175 fathoms, mud, bottom temperature 36° 8 F.

Cat. No.	Locality.	Collector.	Number of specimens.
122861	Off Cocos Island, 1,175 fathoms.....	B. F.....	1

Only one specimen of this species has so far been obtained.

HEMITHYRIS CORNEA Fischer.

Rhynchonella cornea (Fischer MS.) DAVIDSON, Mon. Rec. Brach., pt. 2, p. 171, pl. 25, figs. 5, 6, 1887.

Rhynchonella (Hemithyris) cornea FISCHER and OCHLERT, Exp. Sci. du Travailleur et du Talisman, p. 13, pl. 1, figs. 2a-2u, 1891.

Type locality.—Off Cape St. Vincent, in 57½ fathoms, *Talisman* Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
130327	Off Mogador, in 240 fms.....	<i>Talisman</i> Exp.....	8

This is a well marked species. In the *Talisman* report cited above there seems to be a misprint in the table of dimensions on page 15, 36 and 35 mm. being printed for 26 and 25, respectively.

HEMITHYRIS COLUMNUS Hedley.

Hemithyris columnus HEDLEY, Records of the Australian Museum, vol. 6, pt. 2, p. 44, text figs. 7, 8, 1905.

Type locality.—Off Cape Byron, in 111 fathoms, and east of Wollongong, Australia, in 100 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
333012	Gabo Island, Victoria.....	Hedley.....	4

This species is usually broadly dorsally uniplicate with the margin of the plication a straight line, but in some specimens this line is modified by three small but distinct minor plications, much as in

H. sladeni. It has been referred to *Aetheia* Allan-Thomson, but the Tertiary type of that group is figured by Thomson with a cardinal platform, while in the present species the crura are not united medially.

HEMITHYRIS BARTSCHI, new species.

Shell pellucid gray, thin, rounded-triangular, attenuated behind, widest near the front edge of the valves, anterior margin straight without a trace of flexure; surface shining, with faint incremental and delicate radial lines visible only by magnification; pedicel valve inflated, arcuate, the apex incurved; the beak with, on each side of the foramen, a small spine or projection directed laterally; pseudo-deltidia wide, meeting in front of the foramen but not quite coalescent; hinge teeth feeble, supported by the usual props with a narrow cavity between them and the valve; muscular impressions obscure, the inner surface under magnification showing a minute pavement reticulation; brachial valve less convex; hinge plate feeble, divided mesially to the apex, which is somewhat callous; sockets faintly transversely striated; a low septum, less than one-third the length of the valve, extending forward from the cavity of the beak; apophyses short, slender, twisted, with a squared extremity; height of pedicel valve 18, width 16, convexity 7 mm.; height of brachial valve 16, width 16, convexity 5 mm.; length of septum 5 mm.

Type locality.—Off Makyan Island, Molucca Pass, in 298 fathoms, sand; Bureau of Fisheries station 5621.

Cat. No.	Locality.	Collector.	Number of specimens.
239269	Molucca Pass, 298 fathoms.....	B. F.	1
274134	Off Jolo, Philippines, 161 fathoms.....	B. F.	1

The two little horns at the sides of the beak of this species are quite peculiar, but are gradually worn off with age. It is named in honor of Dr. Paul Bartsch, to whose untiring energy the success of the collecting is due. This species differs from *Compsothyris* in that the septum is not bifurcate behind and is not united to any process from below the crura.

Type.—Cat. No. 239269, U.S.N.M.

HEMITHYRIS SLADENI Dall.

Hemithyris sladeni DALL, Trans. Linn. Soc. London, ser. 2, Zoology, vol 13, pt. 3, p. 440, pl. 26, figs. 7-12, 1910.

Type locality.—Indian Ocean south of the Saya de Malha banks, in 153 to 123 fathoms, station C. 1, of the *Sealark* Expedition, 1905.

Cat. No.	Locality.	Collector.	Number of specimens.
111086	Indian Ocean, 153 fathoms	Sealark Exp.	1

The small duplex angular flexure in front, with the smooth surface, distinguish this from any other known recent species. An exactly similar biplication exists in *Rhynchonella salpinx* Dall, of the Eocene of Wilmington, North Carolina, a fact of which Dr. J. Allan Thomson has expressed himself skeptical.¹ If ventral uniplication is generically important perhaps this peculiarity may be worthy of a sectional name.

Genus NEORHYNCHIA Allan Thomson.

Neorhynchia J. ALLAN THOMSON, Geol. Mag., n. s. dec. 6, vol. 2, p. 388, Sept., 1915.

Shell ventrally uniplicate, foramen hypothyrid.

Type.—*N. strebeli* Dall.

NEORHYNCHIA STREBELI Dall.

Hemithyris strebeli DALL, Bull. Mus. Comp. Zool., vol. 43, p. 441, 1908.

Type locality.—U. S. S. *Albatross*, station 4721, in mid-Pacific, in 2,084 fathoms, ooze, bottom temperature 35° 1 F.

Cat. No.	Locality.	Collector.	Number of specimens.
110741	Mid-Pacific, 2,084 fathoms	B. F.	3
110768	Off Galapagos Islands., 2,035 fathoms	B. F.	1

In this species the foramen is below the apex of the beak, when complete, but the apex is usually worn off by friction through the animal turning on its pedicel, which is very short. I am inclined to think that this is the explanation of all the supposed epithyrid foramina of the recent *Rhynchonellids*.

Genus BASILIOLA Dall.

Basiliola DALL, Bull. Mus. Comp. Zool., vol. 43, p. 442, 1908.

Basiola ALLAN THOMSON, Geol. Mag., n. s., dec. 6, vol. 2, p. 390, 1915.

Type.—*B. beecheri* Dall, 1895, Hawaiian Islands.

BASILIOLOA BEECHERI Dall.

Hemithyris beecheri DALL, Proc. U. S. Nat. Mus., vol. 17, p. 717, pl. 31, figs. 1, 2, 3, 4, July, 1895.

Basiliola beecheri DALL, Bull. Mus. Comp. Zool., vol. 43, p. 442, 1908.

Type locality.—Hawaiian Islands.

¹ Geological Magazine, n. s., dec. 6, vol. 2, p. 388, 1915.

Cat. No.	Locality.	Collector.	Number of specimens.
107009	Near Hawaiian Islands, types, 313 fathoms...	B. F.	3v.
334677	Hawaii, Palolo Channel, 198 fathoms.....	B. F.	4
334679	Hawaii, West coast, 198 fathoms.....	B. F.	1
173031	Hawaii, West coast, 198 fathoms, fig'd.....	B. F.	2
274136	South of Oahu, 252 fathoms.....	B. F.	1v.
334675	South of Oahu, 211 fathoms.....	B. F.	1
173034	North of Maui, 178 fathoms, fig'd.....	B. F.	1
334676	North of Maui, 143 fathoms.....	B. F.	2
334678	Off Kauai, 309 fathoms.....	B. F.	1

The crural plates are narrow and deeply excavated, the crura rather long, slightly twisted and concave on their inner faces. The space behind the dental props is very small and solidly filled with cement in the older specimens. The valves are unusually thick, solid and calcareous. Until I got more perfect specimens than the original types, I suspected that the *H. columnus* of Hedley, might be identical, but with the receipt of perfect individuals an inspection showed sufficient distinctions in and about the cardinalia.

The pedicel tube, homologous with the "collar" of Jackson, but greatly produced and developed, would certainly be taken as of generic value in a fossil species and is not distantly related to the arrangement in the Devonian *Pseudosyrinx*.

BASILIOLA POMPHOLYX, new species.

Shell pellucid, much inflated, light gray, polished, without radial striation and only very faint incremental lines; pedicel valve with a wide concave mesial fold which is not laterally well defined except at the margin where the valve projects in a squarish fashion; the beak is low, the foramen small, under the apex; the deltidial plates wide, firmly united in front of the foramen and produced in a sort of gutter in front; when not worn off the extremity of this gutter extends beyond the plane of the incurved beak; internally the lower extensions of the plates unite without any visible suture to form a broad tube of which the anterior edge is free from the dome of the valve and extends forward as far as the beginning of the dental props; the hinge teeth are very small and weak but strongly cross-striated; a narrow groove extends from under the tube mesially as far as the rather small muscular impressions, the dental props are thin and inconspicuous; the brachial valve is almost hemispherical in inflation, with a broad squarish anterior fold; the crural plates wide, short, separated clear to the apex, the crura very small, short, guttered below; the cavity of the beak sometimes with a low thread-like septum extending forward to the muscular scars, sometimes with a shallow groove which after separating the muscular impressions bifurcates widely, extending nearly to the anterior margin. Height of shell 26; width 28; maximum diameter 17 mm.

Type locality.—Sibuko Bay, Borneo, at station 5592, South of Silungan Island, in 305 fathoms, mud, bottom temperature 43° 3 F.

Cat. No.	Locality.	Collector.	Number of specimens.
274135	Off Panaon Island, Philippine Islands, 585 fathoms	B. F.	1
300863	Off Eastern Luzon, Philippine Islands, 153 fathoms.	B. F.	1v.
300936	Off Eastern Luzon, Philippine Islands, 500 fathoms.	B. F.	1
300668	Off Cagayan Island, Philippine Islands, 495 fathoms.	B. F.	1v.
300769	Off Eastern Palawan Island, Philippine Islands, 1,105 fathoms.	B. F.	1v.
235844	Off Sulade Island, Philippine Islands, 24 fathoms.	B. F.	2
299918	Off Silungan Island, Philippine Islands, 305 fathoms.	B. F.	1½
291071	Off Silungan Island, Philippine Islands, 305 fathoms.	B. F.	4v.
299983	Off Silungan Island, Philippine Islands, 305 fathoms.	B. F.	1v.
229301	Sibuko Bay, Borneo, types, 305 fathoms.....	B. F.	4
300266	Celebes, 540 fathoms.....	B. F.	1v.

Genus FRIELEIA Dall.

Frieleia DALL, Proc. U. S. Nat. Mus., vol. 17, p. 713, 1895.

FRIELEIA HALLI Dall.

Frieleia halli DALL, Proc. U. S. Nat. Mus., vol. 17, p. 714, pl. 24, figs. 6, 9–13, 1895.

Type locality.—Cortez Bank, California coast, in 984 fathoms, bottom temperature 38° F., U. S. Fish Commission station 2919.

Cat. No.	Locality.	Collector.	Number of specimens.
110512	Off Avacha Bay, Kamchatka, 682 fathoms....	B. F.	14
110830	Off Avacha Bay, Kamchatka, 682 fathoms....	B. F.	12
204679	Off Hondo, Japan, 302 fathoms.....	B. F.	1
206363	Bristol Bay, Alaska, ? 4½ fathoms.....	B. F.	1
331743	Southeast of Alaska, Pena, 21 fathoms.....	B. F.	1v.
110829	Off Bowers Bank, 764 fathoms.....	B. F.	3v.
274137	Off British Columbia, 204 fathoms.....	B. F.	1
111021	Off coast of Washington, 559 fathoms.....	B. F.	10
331093	Off coast of Oregon, 93 fathoms.....	B. F.	3
223533	Sta. Barbara Channel, 500 fathoms.....	B. F.	3v.
266869	Off Point Sur, California, 659 fathoms.....	B. F.	6
123148	Off Cortez Bank, 984 fathoms.....	B. F.	1
210093	Southwest of Point Loma, California, 680 fathoms.	B. F.	2
211178	Southwest of Point Loma, California, 650 fathoms.	B. F.	5
107010	Off San Diego, California, 522 fathoms.....	B. F.	2
111020	Off San Diego, California, 822 fathoms.....	B. F.	20
209044	Off San Diego, California, 822 fathoms.....	B. F.	2
209331	Off San Diego, California, 1,059 fathoms.....	B. F.	1v.
209242	Off San Diego, California, 640 fathoms.....	B. F.	1v.
331090	Off San Diego, California, 822 fathoms.....	B. F.	3
130501	Off San Diego, California, 623 fathoms.....	B. F.	6

The specimens from the cold water off Kamchatka were much coarser and more solid than the others, but otherwise similar. A considerable proportion of the specimens are more or less distinctly bilobed, this condition not being accidental, as supposed by Doctor Thomson, while others show hardly a trace of lobation. Both valves are medially more or less concave, the sulcation, if it may be called so, being "opposite." It is much less evident in specimens from colder water.

Genus ATRETIA Gwyn Jeffreys.

Cryptopora JEFFREYS, Nature, vol. 1, p. 136, Dec. 2, 1869; not *Cryptoporus* Motschulsky, 1858 (*Coleoptera*).

Atretia JEFFREYS, Proc. Royal Society, No. 121, p. 421, 1870; Ann. Mag. Nat. Hist., Sept., 1876, p. 251; Proc. Zool. Soc. London, Apr. 16, 1878, p. 412, pl. 23, fig. 4, a-c.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 173, pl. 25, figs. 6-13, 1887. Not *Atretium* Cope, 1861.

Neatretia FISCHER and OEHLERT, Exp. Sci. Travailleux et Talisman, p. 122, 1891.

Type.—*A. gnomon* Jeffreys.

Current nomenclatorial usage would reject *Cryptopora* as homonymous with *Cryptoporus*, but whether the practice would extend so far as to reject *Atretia* on account of *Atretium* is more doubtful. My own feeling is in favor of retaining *Atretia* as valid.

ATRETIA GNOMON Jeffreys.

Cryptopora gnomon JEFFREYS, Nature, Dec. 2, 1869, p. 136.

Atretia gnomon JEFFREYS, Proc. Roy. Soc., No. 121, p. 421, 1870.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 173, pl. 25, figs. 6-13, 1887.

Neatretia gnomon FISCHER and OEHLERT, Exp. Sci. Travailleux et Talisman, p. 122, fig. 11 a-c, 1891.

Type locality.—North Atlantic, northwest of Ireland.

Cat. No.	Locality.	Collector.	Number of specimens.
206479	Off Tromsø, Norway, 650 fathoms.....	N. Atl. Exp. st. 192	1
173631	North Sea.....	N. Atl. Exp.....	1
173627	Northwest of Ireland (cotype).....	Porcupine Exp.....	1
173626	North Atlantic 1,785 fathoms.....	Valorous Exp.....	2
173625	Davis Straits, 1,000 fathoms.....	Valorous Exp.....	1
173624	Davis Straits, 1,450 fathoms.....	Valorous Exp.....	1
130340	North of Azores, 2,200 fathoms.....	Talisman Exp.....	1
46150	South of Marthas Vineyard, 1,537 fathoms....	B. F.....	1
44911	South of Marthas Vineyard, 1,525 fathoms....	B. F.....	Many.
46149	Off Maryland, 1,594 fathoms.....	B. F.....	1
83131	Off Fowey Rocks, Florida, 205 fathoms.....	Dr. Rush.....	6
274138	Off Fowey Rocks, Florida, 100 fathoms.....	Henderson.....	12
274139	Off Key West, Florida, 120 fathoms.....	Henderson.....	14
94367	Off Cuba, 780 fathoms.....	Dr. Rush.....	4
336894	Off Cuba, 150 fathoms.....	Henderson.....	1

The younger specimens show radial striation, which is less evident or absent in the adults.

ATRETIA BRAZIERI Crane.

Atrétia brazieri (Davidson MS.) CRANE, Proc. Zool. Soc., 1886, p. 183; Mon. Rec. Brach., App., p. 175, pl. 25, figs. 16-17a, 1887.

Cryptopora brazieri ALLAN THOMSON, Austr. Antarctic Exp., Brach., p. 43, June, 1918.—HEDLEY, Proc. Linn. Soc. New South Wales, vol. 31, pt. 3, p. 467, pl. 36, figs. 1-2, 1906.

Type locality.—Port Stephens, New South Wales, in 25 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
335705	Off Wollongong, New South Wales, 100 fathoms.	Hedley.....	10

Some of the specimens have the pedicel valve medially furrowed externally, other not. The species is remarkably like the *A. gnomon*.

Family TEREBRATULIDAE.**Genus TEREBRATULINA Orbigny.**

Terebratulina ORBIGNY, Comptes Rendus Acad. Sci., vol. 25, p. 268, 1847.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 17, 1887.

TEREBRATULINA RETUSA Linnaeus.

Anomia retusa LINNAEUS, Syst. Nat., ed. 10, p. 701, 1758; ed. 12, p. 1151, 1767.—HANLEY, Shells of Linnaeus, p. 123, 1855.

Anomia pubescens LINNAEUS, Syst. Nat., ed. 12, p. 1153, 1767.

Anomia caput-serpentis LINNAEUS, Syst. Nat., ed. 12, p. 1153, 1767.—RETZIUS, Dissert. Nova test. Gen., p. 13, 1788. Not of Linnaeus, Syst. Nat., ed. 10, p. 703, 1758, nor of Solander, 1797.

Terebratula pubescens MÜLLER, Prodr. Zool. Danicae, p. 249, 1776.—RETZIUS, Dissert. Nova test. Gen., p. 15, 1788.

Terebratula retusa RETZIUS, Dissert. Nova test. Gen., p. 14, 1788.

Terebratula aurita FLEMING, Philos. Zool., pt. 2, p. 498, pl. 4, fig. 5, 1822; Brit. Anim., p. 369, 1828.

Terebratula costata LOWE, Zool. Journ., vol. 2, p. 105, pl. 5, figs. 8, 9, 9b, 1825 (young).

Terebratula caput-serpentis SOWERBY, Thesaurus, *Terebratula*, p. 343, pl. 68, figs. 2, 3, 4; pl. 72, fig. 116, 1847.

Delthyris spatula MENKE, Syn. Meth. Moll., ed. 2, p. 96, 1830.

Terebratula striata LEACH, Syn. Moll. Gt. Brit., p. 359, pl. 13, figs. 1, 2, 1852.

Terebratulina caputserpentis ORBIGNY, Ann. Sci. Nat., vol. 8, p. 67, pl. 7, figs. 7, 8, 1848.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 365, 1852; Mon. Rec. Brach., pt. 2, p. 17, pl. 3, fig. 12; pl. 4, figs. 1-11; pl. 5, figs. 32-34, 1886.

Type locality.—Norwegian coast.

TEREBRATULINA RETUSA EMARGINATA Risso.

Terebratula emarginata RISSO, Hist. Nat. Eur. MÉR., vol. 4, p. 388, fig. 175, 1826.

Terebratula quadrata RISSO, Hist. Nat. Eur. MÉR., vol. 4, p. 389, fig. 176, 1826.

Terebratula caputserpentis PHILIPPI, En. Moll. Sicil., vol. 2, p. 94, pl. 6, figs. 5a-b, 1830.

Terebratula chemnitzii KÜSTER, Conch. Cab., ed. 2, *Terebratula*, p. 97, pl. 2b, figs. 19, 20, 1868.

Terebratula caputserpentis var. *mediterranea* JEFFREYS, Proc. Zool. Soc., 1878, p. 401.

Type locality.—Mediterranean.

TYPICAL FORM.

Cat. No.	Locality.	Collector.	Number of specimens.
173501	Fig'd. Brit. Conch., Vol. II.	Jeffreys.	3
173503	Fig'd. Brit. Conch., Vol. II., pl. 1, fig. 1.	Jeffreys.	1
173502	Fig'd. Brit. Conch., Vol. V.	Jeffreys.	3
152570	Murman coast.	Hertzenstein.	2
25523	Lofoten Islands.	M. Sars.	8
173504	Zetland.	Barlee.	30
173505	Zetland.	Jeffreys.	50
173506	Zetland.	Jeffreys.	10
173507	Shetland Islands.	Jeffreys.	2
173508	Shetland Islands.	Barlee.	6
73157	Norway.	Stimpson.	5
173509	Shetland Islands.	Jeffreys.	3
173510	Shetland Unsthaf.	Jeffreys.	20
173511	Shetland Unsthaf.	Jeffreys.	2
173512	Shetland Unsthaf.	Jeffreys.	4
110901	Oban, Scotland.	Stimpson.	11
74792	Oban, Scotland.	Walpole.	8
173515	Oban, Scotland.	Barlee.	10
173516	Oban, Scotland.	(Fry).	70
173517	Oban, Scotland.	Jeffreys.	Many.
173513	Lerwich, Scotland.	Jeffreys.	1
173514	Inverary, Scotland.	A. Munro.	3
173518	Argyleshire.	Jeffreys.	3
173519	Hebrides.	Jeffreys.	30
173520	Skye.	Barlee.	3
173521	Skye.	Barlee.	5
173522	Skye.	Barlee.	50
173523	Skye.	Jeffreys.	10
173524	Skye.	Jeffreys.	40
173525	Croulin Island.	Jeffreys.	4
173526	Croulin Island.	Jeffreys.	10
173527	Loch Carron.	Jeffreys.	20
173528	Loch Tyre.	Jeffreys.	6
173529	Loch Fyne.	McNab.	7
173531	Loch Duich.	Barlee.	7
173534	Loch Torridon.	Jeffreys.	2
173530	Scotland.	Jeffreys.	6
13187	Scotland.	McAndrew.	5
77274	Scotland.	Stimpson.	6
334777	West coast of Scotland.	Jeffreys.	5
170248	Firth of Clyde, 95 fathoms.	Jeffreys.	11
173535	North of Scotland, 363 fathoms.	Porcupine Exp.	4
173536	North of Scotland, 632 fathoms.	Porcupine Exp.	3½
173537	North of Scotland; 114 fathoms.	Porcupine Exp.	1
173538	North of Scotland, 345 fathoms.	Porcupine Exp.	2+
173539	North of Scotland, 200 fathoms.	Porcupine Exp.	4
173540	North of Scotland, 250 fathoms.	Porcupine Exp.	3
173541	North of Scotland, 560 fathoms.	Porcupine Exp.	1
173542	North of Scotland, 290 fathoms.	Porcupine Exp.	4
173543	North of Scotland, 155 fathoms.	Porcupine Exp.	3
173545	Station 4, 530 fathoms.	Lightning Exp.	2
173546	Off Belfast, Ireland.	Jeffreys.	4
173547	Belfast Bay.	Jeffreys.	12
173548	Belfast Bay (young).	Humphreys.	1
173549	Belfast Bay.	Jeffreys.	1
173550	Arran Island.	Barlee.	1
173551	Larne (young).	Barlee.	6
173552	Northwest of Ireland, 420 fathoms.	Porcupine Exp.	2
173553	Northwest of Ireland, 164 fathoms.	Porcupine Exp.	1
173554	West of Ireland, 808 fathoms.	Porcupine Exp.	2

Cat. No.	Locality.	Collector.	Number of specimens.
173555	West of Ireland, 90 fathoms.....	<i>Porcupine</i> Exp.....	1
173556	West of Ireland, 173 fathoms.....	<i>Porcupine</i> Exp.....	1
173557	West of Ireland, 109 fathoms.....	<i>Porcupine</i> Exp.....	1
88978	Britain.....	Carpenter.....	2
11891	Britain.....	Damon.....	11
110903	Britain.....	Dall.....	7
110900	Britain.....	Carpenter.....	1
131045	"Europe".....	Lea Coll.....	1
110902	North Atlantic, 345 fathoms.....	Jeffreys.....	4
173558	Off Lands End.....	Anderson.....	1
173560	Osterfiord, Norway.....	Jeffreys.....	1
173561	Vallo, Norway.....	G. O. Sars.....	2
173562	Dröbak, Norway.....	Jeffreys.....	2
173563	(Deformed), Norway.....	Jeffreys.....	1
173565	Cape Breton, France.....	De Folin.....	1

Variety EMARGINATA Risso.

305083	Mediterranean.....	S. Smith.....	1
130331	Off Morocco, 50 fathoms.....	<i>Talisman</i> Exp.....	3
173566	Coast of Morocco, 207 fathoms.....	<i>Porcupine</i> Exp.....	2
173574	West of Soloom Bay, Tunis, 40-120 fathoms.....	<i>Shearwater</i> Exp.....	9
173573	Skerke Bank, Tunis, 30-120 fathoms.....	<i>Shearwater</i> Exp.....	5
173569	Adventure Bank, Tunis, 50-130 fathoms.....	<i>Shearwater</i> Exp.....	7
173568	Adventure Bank, 92 fathoms.....	<i>Porcupine</i> Exp.....	1
173572	Benzert Roads, Tunis.....	<i>Shearwater</i> Exp.....	1
173575	Corsica.....	Susini.....	6
173581	Naples.....	Tiberi.....	4
173589	Adriatic Sea.....	Issel.....	3
173588	(Fry).....	Jeffreys.....	6

Variety ANGUSTATA Jeffreys.

173533	Loch Duich, Scotland.....	Jeffreys.....	3
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Variety GRANDIS Jeffreys.

173571	Benzert Roads, Tunis.....	<i>Shearwater</i> Exp....	20
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Hanley showed in his review of the Linnean shells in 1855 that the original *Anomia caput-serpentis* of Linnaeus in 1758 is a fossil smooth Terebratuloid, probably from the Italian Tertiary, while the recent shell we have been accustomed to call *caput-serpentis* is described in the same publication two pages earlier under the name *retusa*. It is perfectly obvious that the name *caput-serpentis* is excluded from use in the latter connection by all rules. Those who retain some skepticism will do well to consult Hanley's book.

It appears that the spiculation of the Mediterranean form differs from that of the North of Europe species and Blochmann confirms the opinion of Davidson that the former should be regarded as distinct.

The earliest name for the Mediterranean form is *emarginata* of Risso, but the bilobate form is not peculiar to Mediterranean specimens. There are in the Jeffreys collection numerous specimens of *retusa* with this character, and in fact bilobation seems to occur in almost any of the less inflated strongly striated species of the genus as a mutation. The varieties *angustata* and *grandis* of Jeffreys seem to me mere mutations of form, without special significance. On the other hand *T. septentrionalis* and *T. unguicula*, which have been frequently treated as varieties of *T. retusa*, are positively established as distinct species by Blochmann on the basis of their spiculation although it is often extremely difficult to separate them merely on the basis of the shells.

TEREBRATULINA SEPTENTRIONALIS Couthouy.

Terebratula septentrionalis COUTHOUY, Boston Journ. Nat. Hist., vol 2, p. 65, pl. 3,

fig. 18, 1838.—SOWERBY, Thesaurus, *Terebratula*, p. 344, pl. 68, fig. 18, 1847.

Terebratula caputserpentis GOULD, Inv. Mass., p. 141, 1841.—REEVE, Conch. Icon.,

Terebratula, pl. 4, text only, 1860; not of authors.

Terebratula septentrionalis STIMPSON, Checklist of Sh. of N. Am. East Coast, p. 2,

No. 61, 1860; Binney's Gould's Inv. Mass., p. 208, fig. 500, 1870.—DAVIDSON,

Mon. Rec. Brach., pt. 1, p. 28, pl. 5, figs. 1-31, 43-52, 1886.

Cat. No.	Locality.	Collector.	Number of specimens.
274155	Finmark.....	Jeffreys.....	17
173559	Vadsø, Norway.....	G. O. Sars.....	1
173638	Vadsø, Norway.....	G. O. Sars.....	1
173532	Loch Duich, Scotland.....	Jeffreys.....	6
173544	Station 6.....	Valorous Exp.....	1
49300	Off Cape Sable, Nova Scotia.....	B. F.....	4
203033	Off Cape Sable, Nova Scotia.....	B. F.....	1
110866	Le Have Bank, Nova Scotia, 150 fathoms....	Olsen.....	1
110864	Nova Scotia, 60 fathoms.....	Proctor.....	3
110865	Nova Scotia.....	Stearns.....	2
49301	Nova Scotia, 59 fathoms.....	B. F.....	1
49311	Nova Scotia, 47 fathoms.....	B. F.....	8
49315	Nova Scotia, 42 fathoms.....	B. F.....	1
153526	Bedford Basin, Nova Scotia, 33-40 fathoms...	B. F.....	4
153539	Near Halifax, Nova Scotia, 127 fathoms....	B. F.....	1
49318	Halifax, Nova Scotia 43 fathoms.....	B. F.....	2
203038	Halifax, Nova Scotia, 20 fathoms.....	B. F.....	1
203036	Off Halifax, Nova Scotia, 16 fathoms.....	B. F.....	3
49309	Off Halifax, Nova Scotia, 16 fathoms.....	B. F.....	1 v.
49312	Off Halifax, Nova Scotia, 43 fathoms.....	B. F.....	1
49314	Off Halifax, Nova Scotia, 42 fathoms.....	B. F.....	2
49319	Off Halifax, Nova Scotia.....	B. F.....	4
49320	Off Halifax, Nova Scotia, 51 fathoms.....	B. F.....	2
49273	Bay of Fundy, Nova Scotia.....	B. F.....	2
203037	Bay of Fundy, Nova Scotia, 40-55 fathoms...	B. F.....	5
110874	Grand Banks.....	Stimpson.....	1
151751	Grand Banks, 150 fathoms.....	Stimpson.....	1
27541	Grand Manan Island, Maine.....	Stimpson.....	6
49271	Grand Manan Island, Maine.....	B. F.....	6
49272	Grand Manan Island, Maine.....	B. F.....	14
153523	Grand Manan Island, Maine, 28-52 fathoms...	B. F.....	5
49270	Eastport, Maine.....	B. F.....	Many.
73276	Eastport, Maine.....	Stimpson.....	10
110868	Eastport, Maine.....	Stimpson.....	5 v.

Cat. No.	Locality.	Collector.	Number of specimens.
110869	Eastport, Maine.....	Verrill.....	16
131046	Eastport, Maine.....	Cooper.....	9
131047	Eastport, Maine.....	Dr. Jay.....	2
173585	Eastport, Maine.....	Fuller.....	1
173586	Eastport, Maine.....	Skelton.....	1
173587	Eastport, Maine.....	Verrill.....	1
334778	Off Little Hope Light.....	G. K. Allen.....	2
27541	Gulf of Maine.....	Stimpson.....	1
49287	Gulf of Maine, 25 fathoms.....	B. F.....	10
49288	Gulf of Maine, 105 fathoms.....	B. F.....	9
49294	Gulf of Maine, 35 fathoms.....	B. F.....	Many.
59691	Gulf of Maine.....	F. Stearns.....	4
59683	Gulf of Maine.....	Stimpson.....	10
77567	Gulf of Maine, 54 fathoms.....	B. F.....	11
77568	Gulf of Maine.....	B. F.....	1
77569	Gulf of Maine, 100-110 fathoms.....	B. F.....	2
77570	Gulf of Maine, 68 fathoms.....	B. F.....	1
110870	Gulf of Maine.....	Dr. Stearns.....	2
120153	Gulf of Maine.....	McGuire.....	1
153521	Gulf of Maine, 29 fathoms.....	B. F.....	8
153522	Gulf of Maine, 85 fathoms.....	B. F.....	12
153528	Gulf of Maine, 75 fathoms.....	B. F.....	1
153530	Gulf of Maine, 75 fathoms.....	B. F.....	1
153529	Gulf of Maine, 85 fathoms.....	B. F.....	1
153531	Gulf of Maine, 110 fathoms.....	B. F.....	6
203039	Gulf of Maine.....	B. F.....	20
49281	Cashe's Ledge, Maine, 52-90 fathoms.....	B. F.....	Many.
49289	Cashe's Ledge, Maine, 27 fathoms.....	B. F.....	3
49290	Cashe's Ledge, Maine, 110 fathoms.....	B. F.....	10
49291	Cashe's Ledge, Maine, 40 fathoms.....	B. F.....	3
49292	Cashe's Ledge, Maine, 92 fathoms.....	B. F.....	1
110867	Casco Bay, Maine.....	Fuller.....	30
49276	Casco Bay, Maine.....	B. F.....	Many.
49283	Casco Bay, Maine, 33 fathoms.....	B. F.....	1
203040	Casco Bay, Maine.....	B. F.....	2
49329	Off Cape Ann, Massachusetts, 18 fathoms.....	B. F.....	2
49332	Off Cape Ann, Massachusetts, 32 fathoms.....	B. F.....	2
153518	Off Cape Ann, Massachusetts, 53 fathoms.....	B. F.....	15
153524	Off Cape Ann, Massachusetts, 40 fathoms.....	B. F.....	1
153525	Off Cape Ann, Massachusetts, 19 fathoms.....	B. F.....	12
153535	Off Cape Ann, Massachusetts, 38 fathoms.....	B. F.....	1
203035	Gloucester, Massachusetts.....	B. F.....	10
203206	Eastern Point, Massachusetts, 35 fathoms.....	B. F.....	3
49295	Off Salem, Massachusetts, 22 fathoms.....	B. F.....	20
49296	Off Salem, Massachusetts, 35 fathoms.....	B. F.....	1
49302	Off Salem, Massachusetts, 33 fathoms.....	B. F.....	2
49304	Off Salem, Massachusetts, 20 fathoms.....	B. F.....	3
49306	Off Salem, Massachusetts, 50 fathoms.....	B. F.....	8
49308	Off Salem, Massachusetts, 19½ fathoms.....	B. F.....	2
49310	Off Salem, Massachusetts, 26 fathoms.....	B. F.....	1
49322	Off Salem, Massachusetts, 36 fathoms.....	B. F.....	2
49323	Off Salem, Massachusetts, 48 fathoms.....	B. F.....	10
203034	Off Salem, Massachusetts, 45 fathoms.....	B. F.....	3
274176	Boston Harbor, Massachusetts, 16 fathoms.....	B. F.....	5
34881	Off Georges Banks, Massachusetts, 99 fathoms.....	B. F.....	Many.
34914	Off Georges Banks, Massachusetts, 65 fathoms.....	B. F.....	Many.
35096	Off Georges Banks, Massachusetts, 99½ fathoms.....	B. F.....	5
49274	Off Georges Banks, Massachusetts, 150 fathoms.....	B. F.....	4
49275	Off Georges Banks, Massachusetts.....	B. F.....	2
50601	East of Georges Banks, Massachusetts, 111 fathoms.....	B. F.....	3
50603	East of Georges Banks, Massachusetts, 72 fathoms.....	B. F.....	9

Cat. No.	Locality.	Collector.	Number of specimens.
50605	East of Georges Banks, Massachusetts, 677 fathoms.	B. F.	1
110872	Georges Banks, Massachusetts, 45 fathoms....	S. Smith.....	5
110873	Georges Banks, Massachusetts.....	Schr. <i>Sultana</i>	6
203041	Georges Banks, Massachusetts, 101 fathoms....	B. F.	2
49293	On Platts Banks, Massachusetts, 32 fathoms....	B. F.	2
49298	Massachusetts Bay, 90 fathoms.....	B. F.	2
49324	Massachusetts Bay, 17 fathoms.....	B. F.	5
49325	Massachusetts Bay, 23 fathoms.....	B. F.	5
49326	Massachusetts Bay, 19 fathoms.....	B. F.	2
49327	Massachusetts Bay, 28 fathoms.....	B. F.	4
49330	Massachusetts Bay, 26 fathoms.....	B. F.	1
49331	Massachusetts Bay, 19 fathoms.....	B. F.	2
49342	Massachusetts Bay, 22 fathoms.....	B. F.	2
77566	Massachusetts Bay, 16 fathoms.....	B. F.	2
77571	Massachusetts Bay, 35 fathoms.....	B. F.	9
77573	Massachusetts Bay, 19 fathoms.....	B. F.	2
110871	Massachusetts Bay.....	Dall.....	1
153520	Massachusetts Bay, 22 fathoms.....	B. F.	6
153532	Massachusetts Bay, 26 fathoms.....	B. F.	1
153533	Massachusetts Bay, 26 fathoms.....	B. F.	5
45876	Off Cape Cod, Massachusetts, 90 fathoms.....	B. F.	5
49333	Off Cape Cod, Massachusetts, 18 fathoms.....	B. F.	5
49334	Off Cape Cod, Massachusetts, 16 fathoms.....	B. F.	9
49336	Off Cape Cod, Massachusetts, 80 fathoms.....	B. F.	9
49337	Off Cape Cod, Massachusetts, 72 fathoms.....	B. F.	6
49338	Off Cape Cod, Massachusetts, 135 fathoms.....	B. F.	4
49339	Off Cape Cod, Massachusetts, 67 fathoms.....	B. F.	6
49340	Off Cape Cod, Massachusetts, 45 fathoms.....	B. F.	2
49341	Off Cape Cod, Massachusetts, 75 fathoms.....	B. F.	10
49343	Off Cape Cod, Massachusetts, 7 fathoms.....	B. F.	2
49345	Off Cape Cod, Massachusetts, 46 fathoms.....	B. F.	6
49346	Off Cape Cod, Massachusetts, 96 fathoms.....	B. F.	5
153534	Off Cape Cod, Massachusetts, 12 fathoms.....	B. F.	1
202884	Off Cape Cod, Massachusetts, 67 fathoms.....	B. F.	4
40186	Off Nantucket Shoals, Massachusetts, 250 fathoms.	B. F.	13
153527	Nantucket Island, Massachusetts, 5 fathoms..	B. F.	2
110875	Marthas Vineyard, Massachusetts, 1,976 fathoms.	B. F.	1
34685	Marthas Vineyard, Massachusetts, 197 fathoms.	B. F.	14
35297	Marthas Vineyard, Massachusetts, 209 fathoms.	B. F.	8
35632	Marthas Vineyard, Massachusetts, 197 fathoms.	B. F.	3
40105	South of Marthas Vineyard, Massachusetts, 195 fathoms.	B. F.	Many.
45881	South of Marthas Vineyard, Massachusetts, 193 fathoms.	B. F.	7
45874	Marthas Vineyard, Massachusetts, 192 fathoms.	B. F.	1
45875	Marthas Vineyard, Massachusetts, 238 fathoms.	B. F.	1
45877	Marthas Vineyard, Massachusetts, 245 fathoms.	B. F.	5
45879	Marthas Vineyard, Massachusetts, 291 fathoms.	B. F.	5
45880	Marthas Vineyard, Massachusetts, 225 fathoms.	B. F.	6
51327	Marthas Vineyard, Massachusetts, 317 fathoms.	B. F.	15
51328	Marthas Vineyard, Massachusetts, 264 fathoms.	B. F.	20
51329	Marthas Vineyard, Massachusetts, 225 fathoms.	B. F.	10
51332	Marthas Vineyard, Massachusetts, 234 fathoms.	B. F.	10
153536	Marthas Vineyard, Massachusetts, 396 fathoms.	B. F.	1
203032	Marthas Vineyard, Massachusetts, 458 fathoms.	B. F.	30
203096	Marthas Vineyard, Massachusetts, 458 fathoms.	B. F.	10
153538	Off Newport, R. I., 21 fathoms.....	B. F.	5
153519	Off Block Island, R. I.....	B. F.	20
153537	Fishers Island, New York, 5 fathoms.....	B. F.	1
202882	Fishers Island Sound, New York, 7 fathoms..	B. F.	1
202883	Fishers Island (?), New York.....	B. F.	3

This species can generally be distinguished from *T. retusa* by its finer sculpture and more oval form, but varieties approach one another very closely so far as external aspect is concerned. The usual mutations of form occur very often. This species is subject to the (commensal ?) growth of a sponge which when young appears like a normal pubescence, as in *T. retusa*, but when full grown becomes a spongy ball in which the brachiopod is entirely concealed.

The north European specimens appear to be correctly identified, but their spicules have not been examined.

TEREBRATULINA UNGUICULA Carpenter.

Terebratula unguicula CARPENTER, Proc. Zool. Soc., 1865, p. 201, figs. 1-4.

Terebratulina unguicula DALL, Cat. Rec. Brach., Proc. Acad. Nat. Sci. Phila. for 1873, p. 177; 1877, p. 156.

Terebratulina caputserpentis var. *unguicula* DAVIDSON, Mon. Rec. Brach., pt. 1, p. 25, 1886.—DALL, Proc. U. S. Nat. Mus., vol. 17, No. 1032, p. 719, pl. 32, figs. 2, 5, 1895.

Type locality.—Monterey, California. Doctor Cooper.

Cat. No.	Locality.	Collector.	Number of specimens.
15264	Monterey, California (cotype) 20 fathoms.....	Cooper.....	1
224264	Off Pribilof Islands, Alaska, 150 fathoms.....	B. F.....	9
224370	Off Pribilof Islands, Alaska, 150 fathoms.....	B. F.....	1
224282	Off Pribilof Islands, Alaska, 121 fathoms.....	B. F.....	2
130518	Off Pribilof Islands, Alaska, 121 fathoms.....	B. F.....	2
224281	Off Pribilof Islands, Alaska, 121 fathoms.....	B. F.....	10
206729	Off Pribilof Islands, Alaska, 142 fathoms.....	B. F.....	1
204672	Off Avacha Bay, 682 fathoms.....	B. F.....	20
212823	West of Unalaska, Alaska, 576 fms.....	B. F.....	1
123152	North of Unalaska, Alaska, 351 fathoms.....	B. F.....	3
212826	North of Unalaska, Alaska, 350 fathoms.....	B. F.....	1
222289	North of Unalaska, Alaska, 309 fathoms.....	B. F.....	1
222290	North of Unalaska, Alaska, 309 fathoms.....	B. F.....	1
110893	Harbor of Unalaska, 80 fathoms.....	Dall.....	2 v.
110888	Bay of Unalaska, Alaska, 60 fathoms.....	Dall.....	3
123155	Iliuliuk Harbor, Alaska, 85 fathoms.....	B. F.....	12
224004	Ridge, Unalaska, Alaska, 60 fathoms.....	Dall.....	2
222271	Captains Bay, Unalaska, 85 fathoms.....	Dall.....	2
222272	Captains Bay, Unalaska, 85 fathoms.....	Dall.....	2
212824	Captains Bay, Unalaska, 85 fathoms.....	Dall.....	3
206508	South of Unimak Island, Alaska, 61 fathoms.....	B. F.....	1
224009	South of Unimak Island, Alaska, 61 fathoms.....	B. F.....	3
212820	South of Unimak Island, Alaska, 61 fathoms.....	B. F.....	12
110890	Off Nagai Island, Alaska, 75 fathoms.....	Dall.....	1
110889	Pirate Cove, Alaska.....	Dall.....	1
222223	Chignik Bay, Alaska, 42 fathoms.....	B. F.....	4
222595	Chignik Bay, Alaska, 60 fathoms.....	B. F.....	3
222204	Chignik Bay, Alaska, 28 fathoms.....	B. F.....	4
224578	Southeast of Alaska Peninsula, 110 fathoms.....	B. F.....	5
228762	Southeast of Alaska, Peninsula, 58 fathoms.....	B. F.....	1
222397	Southeast of Alaska Peninsula, 68 fathoms.....	B. F.....	2
222181	Shelikoff Strait, Alaska, 56 fathoms.....	B. F.....	3
222159	Afognak Bay, Alaska, 16 fathoms.....	B. F.....	5
224443	Kodiak Islands, Alaska.....	B. F.....	1
55820	Kodiak Islands, Alaska.....	Fisher.....	1
226049	Uyak Bay, 66 fathoms.....	B. F.....	3

Cat. No.	Locality.	Collector.	Number of specimens.
110891	Port Etches, 15 fathoms.....	Dall.....	10
110892	Port Etches, 15 fathoms.....	Dall.....	8
223637	Dundas Bay, 78 fathoms.....	B. F.....	1
222292	Lynn Canal, 300 fathoms.....	B. F.....	2
222198	Kasaan Bay, 95 fathoms.....	B. F.....	3
208928	Gastineau Channel, 80 fathoms.....	Harriman Exp.....	7
226211	Sumner Strait, 218 fathoms.....	B. F.....	1
222130	Behm Canal, 175 fathoms.....	B. F.....	2
222153	Behm Canal, 65 fathoms.....	B. F.....	4
222557	Behm Canal, 63 fathoms.....	B. F.....	2
222154	Behm Canal, 85 fathoms.....	B. F.....	1
226218	Stephens Passage, 188 fathoms.....	B. F.....	2
216401	Forrester Island, 50 fathoms.....	Willett.....	1
226250	Queen Charlotte Sound, 107 fathoms.....	B. F.....	3
226129	Queen Charlotte Sound, 145 fathoms.....	B. F.....	1
110894	Off British Columbia, 238 fathoms.....	B. F.....	9
222202	Gulf of Georgia, 190 fathoms.....	B. F.....	6
223566	Gulf of Georgia, 195 fathoms.....	B. F.....	1
110895	Victoria, British Columbia.....	Fisher.....	1
110896	Victoria, British Columbia 16 fathoms.....	Richardson.....	5
210211	Fuca Straits, 34 fathoms.....	B. F.....	1
206725	Fuca Straits, 152 fathoms.....	B. F.....	1
224478	Fuca Straits, 135 fathoms.....	B. F.....	1
224567	Fuca Straits, 115 fathoms.....	B. F.....	2
274169	San Juan Ids., 35 fathoms.....	Oldroyd.....	4
133288	Port Orchard, 60 fathoms.....	Johnson.....	1
123154	Santa Cruz, California 240 fathoms.....	B. F.....	1
209342	Santa Barbara, California. 38 fathoms.....	B. F.....	1
110897	Santa Cruz, Island. 155 fathoms.....	B. F.....	25
130403	Santa Cruz Island, 31 fathoms.....	B. F.....	4
209639	San Miguel Island, 53 fathoms.....	B. F.....	1
209352	Santa Rosa Island., 41 fathoms.....	B. F.....	1
110824	Anacapa Island.....	B. F.....	2
334581	La Jolla, California.....	Orcutt.....	7
334666	La Jolla, California.....	Ritter.....	1
109604	Point Loma, California, 15 fathoms.....	Hemphill.....	3
308966	Pacific Beach, California.....	Orcutt.....	1
73914	San Diego, California.....	Stearns.....	3
211745?	Cape San Lucas, 21 fathoms.....	B. F.....	3 yo.

This species in the North Pacific takes the place which *T. retusa* holds in the North Atlantic. The two species are chiefly differentiated by the character of their spiculae.

TEREBRATULINA VALDIVIAE Blochmann.

Terebratulina valdiviae BLOCHMANN, Zeitsch. für Wiss. Zoologie, vol. 90, pp. 601, 639, pl. 36, figs. 5, 6, 1908.

Type locality.—Off Nias, Sumatra, *Valdivia* Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
110437	Cotypes, Sumatra, 366 fathoms.....	Blochmann.....	2
110823	Off Avacha Bay, 682 fathoms.....	B. F.....	20
110843	Korea.....	Dall.....	1
204673	Gulf of Tartary, 673 fathoms.....	B. F.....	1
110844	Off Honshu Island, Japan, 265 fathoms.....	B. F.....	1

Cat. No.	Locality.	Collector.	Number of specimens.
204675	Off Hondo Island, Japan, 65 fathoms.	B. F.	1
299971	Off Silungan, Philippine Islands, 305 fathoms.	B. F.	1
291070	Off Silungan, Philippine Islands, 305 fathoms.	B. F.	1½
238829	Off Mindanao, Philippine Islands, 182 fathoms.	B. F.	40
298972	Off Mindanao, Philippine Islands, 219 fathoms.	B. F.	3 v.
238814	Off Mindanao, Philippine Islands, 169 fathoms.	B. F.	3
298947	Off Mindanao, Philippine Islands, 219 fathoms.	B. F.	3 v.
291236	Off Tawitawi, Philippine Islands, 240 fathoms.	B. F.	3
238895	Off Cebu, Philippine Islands, 310 fathoms.	B. F.	15
246335	Off North Burias, Philippine Islands, 105 fathoms.	B. F.	12 v.
240100	Off (?) Philippine Islands.	B. F.	1
238214	China Sea, 340 fathoms.	B. F.	1
297057	China Sea, 230 fathoms.	B. F.	1
239310	Molucca Pass, 265 fathoms.	B. F.	1
173591	Australia (?).	Flower.	1

This species much resembles *T. unguicula* but is generally a little smaller and flatter, with the outline more triangular. The spiculation is sufficiently different in Blochmann's opinion to separate the species. The tropical distribution also reënforces the argument.

TEREBRATULINA HAWAIIENSIS, new species.

Shell ovate, white or slightly brownish, rather compressed, thin, closely radially finely threaded, the threads coarser and more distinctly granulated by incremental lines near the beaks; foramen in the pedicel valve large, the deltidial plates narrow, oblique, widely separated; peduncular collar strong, short, with free anterior edge, dental processes strong, without props; brachial valve with the dental plates rather widely separated, between them in the young a concave wide rugose cardinal process which in older shells becomes irregular in shape and relatively less prominent; the loop is slender and rather wide; the genital sinuses are profusely reticulated and cover the whole disk of the valve to within a very short distance of the margin. Length of shell, 19, width 15, diameter 8 mm. The Australian specimen measures, respectively, 26, 20, and 12 mm.

Type locality.—Hawaiian Islands, Bureau of Fisheries.

Cat. No.	Locality.	Collector.	Number of specimens.
274156	Type. Hawaiian Islands.	B. F.	1
211013	Port Adelaide, Australia.	Sowerby.	1

This species appears to be separated from its nearest relations by details of the cardinalia and especially by its densely reticulate genital sinuses which exhibit less bilateral symmetry and simplicity than in any other species known to me. Externally it seems most like *T. callinome* Dall, which has quite simple and regular reticulate

sinuses and much wider and shorter deltidial plates. *T. crossei* Davidson grows much larger, is less coarsely striated, and while its genital sinuses are minutely reticulated the two symmetrical groups are widely separated by a space free of sinuses.

TEREBRATULINA CROSSEI Davidson.

Terebratulina crossei DAVIDSON, Journ. de Conchyl., vol. 30, p. 106, pl. 7, fig. 1, 1882; Mon. Rec. Brach., vol. 1, p. 33, pl. 3, figs. 4, 5, 6, 1886.

Type locality.—Sagami Bay, Japan.

Cat. No.	Locality.	Collector.	Number of specimens.
110833	Enosima, Japan.....	Fisher.....	1
110832	Yokohama.....	F. Stearns.....	2
219900	Off Redondo, California, 60 fathoms.....	Dr. Tremper.....	1

On a bunch of coral rock hooked up by fishermen from 60 fathoms off Redondo, California, several brachiopods were attached which seemed to me different from the *Laqueus californicus* usually found there, and after my return to Washington, Dr. R. H. Tremper, the collector, generously donated one of them to the United States National Museum. It was a great surprise to find the Japanese species on our coast, but there seems no doubt about the identification of the shell. The dried animal showed the reflected part of the brachia comprising the median coil was not, as usual, united by a thin band of tissue but the right and left brachia appeared to be quite free from one another medially except at the posterior commissure; while in the nearest related species, *T. callinome*, a membrane exists between the two arms of the reflected loop and back over the shelly loop to the vicinity of the adductors. The spiculae were remarkably visible under a hand lens in beautiful stellate forms and profusely invading the tissues everywhere. The genital sinuses comprise two groups separated distinctly from one another by a space entirely free from sinuses and each group comprising about one half the space of its side of the valve, extending nearly to the anterior margin of the valve and composed of a multitude of small reticulations densely carpeted with spiculae. The species reported by Fischer and Oehlert from Magellan Straits, under this name, is said by Blochmann to be distinct.

TEREBRATULINA CALLINOME, new species.

Shell resembling *T. crossei* Davidson on a smaller scale, but more sharply sculptured, whitish or pale salmon-colored, glistening, the radial sculpture of sharp striae with flattish wider interspaces (not raised as in *T. japonica*); the foramen large, the deltidial plates small, not coalescent medially; brachial valve with slender brachia with rather short filaments, the reflected arms united by a membrane as

described under the last species, the loop narrow, compressed, rather long, with a strong median fold; genital sinuses about half as long as the valve, densely vermicular, broad behind, in front narrower with two or three lateral branches, the two series separated by at least half the width of the valve. Length of shell 31; width 24, diameter 19 mm.

Type locality.—Cebu, Philippine Islands, in 310 fathoms, U. S. Bureau of Fisheries.

Cat. No.	Locality.	Collector.	Number of specimens.
110814	Goto Islands, Japan, 181 fathoms.....	B. F.....	1
110816	Off Honshu Islands, Japan, 125 fathoms.....	B. F.....	1
H0835	Off Yokohama, Japan.....	F. Stearns.....	1
110815	Kagoshima Gulf, 103 fathoms.....	B. F.....	2
273658	Kii, Japan.....	Hirasé.....	3
204677	Off Hondo, Japan, 448 fathoms.....	B. F.....	1
204674	Off Hondo, Japan, 302 fathoms.....	B. F.....	1
204678	Off Hondo, Japan, 88 fathoms.....	B. F.....	1
204676	Eastern Sea, Japan, 95 fathoms.....	B. F.....	1
229360	West of Sequijor, Philippine Islands, 254 fathoms.	B. F.....	2
238880	(Types) Cebu, Philippine Islands, 310 fathoms.	B. F.....	40
295908	West of Luzon, Philippine Islands, 170 fathoms.	B. F.....	2½
296272	West of Luzon, Philippine Islands, 198 fathoms.	B. F.....	2 v.
294638	Off Jolo, Philippine Islands, 161 fathoms....	B. F.....	Many yo.
237994	Off Balabac, Philippine Islands, 68 fathoms..	B. F.....	1
238828	Mindanao, Philippine Islands, 182 fathoms...	B. F.....	3
220094	Mindanao, Philippine Islands, 162 fathoms...	B. F.....	1
295322	Off Mindanao, Philippine Islands, 100 fathoms.	B. F.....	1 v.
298968	Off Mindanao, Philippine Islands, 219 fathoms.	B. F.....	1 v.
299276	Off Simaluc, Philippine Islands, 340 fathoms.	B. F.....	1
294715	Off North Burias, Philippine Islands, 105 fathoms.	B. F.....	9
299748	Off Sipadan, Borneo, 347 fathoms.....	B. F.....	3

There is no perceptible folding of the valves in any of the specimens. This species has been received with the label "*T. japonica*" and it is likely that young specimens have been confused with that species which is of the *retusa* type, while the present species leans toward *T. crossei*.

The reception of abundant material gives an opportunity for discrimination between similar species which can not be afforded by a few specimens.

TEREBRATULINA JAPONICA Sowerby.

Terebratula japonica SOWERBY, Proc. Zool. Soc., 1846, p. 91; Thes. Conch., vol. 1, p. 344, pl. 68, figs. 7, 8, 1847. (Not of Adams and Reeve, 1850).—REEVE, Conch. Icon., *Terebratula*, pl. 4 figs. 15c, 16, 1860.

Terebratula angusta ADAMS and REEVE, Voy. Samarang, Zool. Moll. p. 71, pl. 21, fig. 2, 1850.—REEVE, Conch. Icon., *Terebratula*, pl. 4, fig. 16, 1860.

Terebratulina japonica DALL, Proc. Acad. Nat. Sci. Phila., for 1873, p. 180 (*Syn. excl. ex parte*).—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 34, pl. 3, figs. 7–11, 1886.

Terebratulina caput-serpentis DAVIDSON, Proc. Zool. Soc. 1871, p. 303, pl. 30, fig. 8.

Cat. No.	Locality.	Collector.	Number of specimens.
110817	Korea Strait, 59 fathoms	B. F.	1
204687	Korea Strait, 59 fathoms	B. F.	1
110818	Korea Strait, 59 fathoms	B. F.	4
110819	Korea Strait, 59 fathoms	B. F.	2
206800	Suruga Gulf, Japan, 108 fathoms	B. F.	2
278157	Japan Sea, 44 fathoms	B. F.	20 yo.
110820	Eastern Sea, 106 fathoms	B. F.	1
110821	Goto Islands, Japan, 95 fathoms	B. F.	1
110822	Honshu Islands, Japan, 75 fathoms	B. F.	1
110838	Sunosaki, Japan, 49 fathoms	B. F.	1
110839	Honshu Islands, Japan, 65 fathoms	B. F.	3
193633	Honshu Islands, Japan, 55 fathoms	B. F.	1
110840	Japan	Fisher	1
278158	Hakodate, Japan	E. S. Morse	12 yo.
278159	Yenoshima, Japan	E. S. Morse	1

The above are typical and I feel no doubt of the identity of *japonica* Sowerby and *angusta* Adams. I think this shell was more or less confused with *T. callinome* by Davidson and others, doubtless from want of sufficient material for comparison. The valves show no sign of folding or bilobation.

TEREBRATULINA REEVEI, new species.

The following material I believe to belong to *T. japonica* Adams and Reeve (fig. 1, 1850) not Sowerby. I am uncertain whether it should be regarded as a distinct species or not, though from the entire absence of large specimens, such as occur in Japan, I am inclined to believe in its distinctness. It differs from the young specimens of *T. japonica* Sowerby by its tendency to bilobation, and in a general way by its usually coarser sculpture, its coarsely crenulated inner margin, the loop with the lower medial portion projected as a sharp point while in *japonica* Sowerby it is squarely truncated in front. The brachia are like those in *T. retusa*, the genital sinuses reticulated, adjacent, and occupying the middle half of the shell with no distinct branches, and with a covering of elegantly stellate spiculae, easily visible under a hand lens. An average specimen measures 8 mm. long by 6.5 wide, and about 3 mm. in diameter, the largest about 15 mm. in length. Under the circumstances I propose to give it the provisional name of *reevei*.

Type locality.—Near Lubang, Philippines, in 117 fathoms, at station 5279.

Cat. No.	Locality.	Collector.	Number of specimens.
111064	Off Luzon, Philippine Islands, 105 fathoms...	B. F.....	2
295621	Off Mindoro, Philippine Islands, 244 fathoms.	B. F.....	1 $\frac{1}{2}$
292380	Off Tablas, Philippine Islands, 73 fathoms...	B. F.....	7
297576	Off Balabac, Philippine Islands, 68 fathoms...	B. F.....	15
297487	Palawan Pass, Philippine Islands, 375 fathoms.	B. F.....	2
299038	Sulu Islands, Philippine Islands, 243 fathoms.	B. F.....	1 $\frac{1}{2}$
298770	Off South Negros, Philippine Islands, 254 fathoms.	B. F.....	6
237378	Davao, Gulf, Philippine Islands, 100 fathoms.	B. F.....	1
298312	Northwest Leyte, Philippine Islands, 144 fathoms.	B. F.....	15
291278	Northwest Leyte, Philippine Islands, 114 fathoms.	B. F.....	1
299342	Tawitawi, Philippine Islands, 340 fathoms...	B. F.....	5
299323	Tawitawi, Philippine Islands, 340 fathoms...	B. F.....	1 $\frac{1}{2}$
299322	Tawitawi, Philippine Islands, 340 fathoms...	B. F.....	1
299226	Tawitawi, Philippine Islands, 340 fathoms...	B. F.....	3
292225	Tawitawi, Philippine Islands, 230 fathoms...	B. F.....	6
292924	Tawitawi, Philippine Islands, 49 fathoms...	B. F.....	4
292095	Tawitawi, Philippine Islands, 49 fathoms...	B. F.....	1
111065	Tawitawi, Philippine Islands, 230 fathoms...	B. F.....	1
292107	North Cebu, Philippine Islands, 182 fathoms.	B. F.....	1
295319	Mindanao, Philippine Islands, 100 fathoms...	B. F.....	1
238830	Mindanao, Philippine Islands, 182 fathoms...	B. F.....	1
238824	Mindanao, Philippine Islands, 182 fathoms...	B. F.....	2
237545	(Types) Lubang, Philippine Islands, 117 fathoms.	B. F.....	8
237540	Lubang, Philippine Islands, 117 fathoms....	B. F.....	2
230242	Off Jolo, Philippine Islands, 20 fathoms....	B. F.....	1
240075	Manila Bay, Philippine Islands, 10-20 fathoms.	B. F.....	1
294380	Manila Bay, Philippine Islands, 135 fathoms...	B. F.....	6
230126	Off Point Talin, Philippine Islands, 201 fathoms.	B. F.....	1
230055	Off Point Talin, Philippine Islands, 248 fathoms.	B. F.....	1 v.
295830	Off West Luzon, Philippine Islands, 170 fathoms.	B. F.....	1 $\frac{1}{2}$
295776	Off West Luzon, Philippine Islands, 220 fathoms.	B. F.....	1
295454	Off West Luzon, Philippine Islands, 214 fathoms.	B. F.....	1
295950	Off West Luzon, Philippine Islands, 170 fathoms.	B. F.....	1
296220	Off West Luzon, Philippine Islands, 210 fathoms.	B. F.....	2
229537	Off Mindoro, Philippine Islands, 162 fathoms.	B. F.....	2 v.
294677	Off North Burias, Philippine Islands, 105 fathoms.	B. F.....	Many.
246324	Off North Burias, Philippine Islands, 105 fathoms.	B. F.....	2
294666	Off North Burias, Philippine Islands, 105 fathoms.	B. F.....	8
294922	Marinduque, Philippine Islands, 530 fathoms.	B. F.....	1
300494	Off East Cebu, Philippine Islands, 159 fathoms.	B. F.....	1
291161	Sibuku Bay, Borneo, 292 fathoms.....	B. F.....	1 v.
291166	Sibuku Bay, Borneo, 292 fathoms.....	B. F.....	6
290954	Sibuku Bay, Borneo, 347 fathoms.....	B. F.....	3
299905	Silungan Island, Borneo, 305 fathoms.....	B. F.....	2 $\frac{1}{2}$
291223	Off Sibutu Island, Borneo, 175 fathoms.....	B. F.....	1 v.
299570	Off Sibutu Island, Borneo, 175 fathoms.....	B. F.....	1 v.
299670	Off Sibutu Island, Borneo, 292 fathoms.....	B. F.....	3

TEREBRATULINA ABYSSICOLA Adams and Reeve.

Terebratula abyssicola ADAMS and REEVE, Voy. Samarang, Moll., p. 72, pl. 21, fig. 5, 1850.—REEVE, Conch. Icon. *Terebratula*, pl. 4, fig. 14.

Terebratulina abyssicola DAVIDSON, Mon. Rec. Brach., pt. 1, p. 37, pl. 5, fig. 54, 1886.

Terebratula radiata REEVE, Conch. Icon. *Terebratula*, pl. 3, figs. 7a–b, 1860.

Terebratulina radiata DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 180.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 34, pl. 6, figs. 9–14, 1886.

Type locality.—Cape of Good Hope, 120 fathoms, Sir E. Belcher.

Cat. No.	Locality.	Collector.	Number of specimens.
110439	Off Cape of Good Hope.....	Belcher.....	1
127017	Port Elizabeth, South Africa.....	Rolle.....	7
110438	Aguthas Bank.....	Blochmann.....	3
110841	Cape of Good Hope.....	Sowerby.....	3
110842	Cape of Good Hope, 120 fathoms.....	Belcher.....	1

Number 110842 is a cotype of *T. radiata* from Belcher's collection through Gwyn Jeffreys. Reeve's reference to Korea is an error of memory. The two forms are identical.

TEREBRATULINA KIIENSIS Dall and Pilsbry.

Terebratulina kiiensis DALL and PILSBRY, Nautilus, vol. 5, No. 2, June, 1891, p. 18, pl. 1, figs. 4, 5; Proc. U. S. Nat. Mus., vol. 17, 1894, p. 720, pl. 32, figs. 8, 9.—PILSBRY, Moll. Brach. of Japan, Mar., 1891, p. 152, pl. 11, figs. 9, 10.

Type locality.—Coast of the Province of Kii, Japan. F. Stearns.

Cat. No.	Locality.	Collector.	Number of specimens.
128463	Kii Province, Japan (cotype).....	F. Stearns.....	1
226205	Japan Sea, 265 fathoms.....	B. F.....	2
274160	Yenoshima.....	Morse.....	2
110837	Off Honshu Island, 265 fathoms.....	B. F.....	1
110825	Off Honshu Island, 70 fathoms.....	B. F.....	1
123151	Unalaska, Alaska, 309 fathoms.....	B. F.....	1½
110336	Coast of Washington, 559 fathoms.....	B. F.....	2
123153	Santa Cruz, California, 240 fathoms.....	B. F.....	1
123154	Santa Cruz, California, 240 fathoms.....	B. F.....	4
208868	San Nicolas Island, California, 451 fathoms...	B. F.....	1

It has been a great surprise to find this fine species described from Japan inhabiting the deep water of the Pacific coast, together with the presence of *T. crossei* Davidson, and the remarkable *Terebratula sakhalinensis* Dall. The large size and rotund disk-like form differentiate it from any of the other species of the genus.

TEREBRATULINA CANCELLATA Koch.

Terebratula cancellata KOCH, in Küster, Conch. Cab., ed. 2, *Terebratula*, p. 35, pl. 2b, figs. 11, 12, 13, 1848.—SOWERBY, Thes. Conch., vol. 1, p. 358, pl. 71, figs. 93-95, 1847.—REEVE, Conch. Icon. *Terebratula*, pl. 4, fig. 13, 1860.

Terebratulina cancellata DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 179.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 35, pl. 6, figs. 1-8, 1886.

Type locality.—Western Australia.

Cat. No.	Locality.	Collector.	Number of specimens.
110834	South Australia.....	Sowerby.....	1
332788	South Australia.....	Fulton.....	4

TEREBRATULINA CAVATA Verco.

Terebratulina cavata VERCO, Trans. Royal Soc. of South Australia, vol. 34, p. 95, pl. 28, figs. 1-5, 1910.

Type locality.—Off Cape Jaffa, South Australia, in 130 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
214308	Off Cape Jaffa, 130 fathoms.....	Verco.....	2

TEREBRATULINA CAILLETI Crosse.

Terebratulina cailleti CROSSE, J. de Conchyl., vol. 13, p. 27, pl. 1, figs. 1, 2, 3, 1865.—

DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 10, 1871.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 26, pl. 5, figs. 41, 42, 1886.

Type locality.—On the lee side of Guadeloupe Island, West Indies, in about 100 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
214441?	Grand Banks.....	Clarke.....	1 yo.
108251	Off Georgia, 449 fathoms.....	B. F.....	12
108215	Off Fernandina, 294 fathoms.....	B. F.....	20
107526	Florida Keys, 200 fathoms.....	Nutting.....	1
274161	Off Sand Key, 115 fathoms.....	Henderson.....	8
274162	Off Sambo Reef, 120 fathoms.....	Henderson.....	Many.
64240	Tortugas, 101 fathoms.....	U. S. S. <i>Blake</i>	1
64241	Tortugas, 539 fathoms.....	U. S. S. <i>Blake</i>	3
110889	Chorrera, Cuba, 230 fathoms.....	U. S. S. <i>Blake</i>	3
63239	Off Havana, Cuba, 450 fathoms.....	Sigsbee.....	9
93825	Off Havana, Cuba, 201 fathoms.....	B. F.....	1
94075	Off Havana, Cuba, 114 fathoms.....	B. F.....	1
64238	Off Havana, Cuba, 400 fathoms.....	U. S. S. <i>Blake</i>	1
94082	Yucatan Bank, 399 fathoms.....	B. F.....	1
226293	Mayaguez, Porto Rico, 224 fathoms.....	B. F.....	1
64243	Dominica, 18 fathoms.....	U. S. S. <i>Blake</i>	1

Cat. No.	Locality.	Collector.	Number of specimens.
64244	Sta. Lucia, 164 fathoms.....	U. S. S. <i>Blake</i>	3
64242	Grenadines, 127 fathoms.....	U. S. S. <i>Blake</i>	1
64237	Barbados, 69 fathoms.....	U. S. S. <i>Blake</i>	25
314854	Barbados, 80 fathoms.....	Henderson.....	35
314853	Barbados.....	Henderson.....	25
314852	Barbados, 60-70 fathoms.....	Henderson.....	25
314851	Barbados, 45-75 fathoms.....	Henderson.....	6
314850	Barbados, 80 fathoms.....	Henderson.....	20
314849	Barbados, 70-80 fathoms.....	Henderson.....	Many.
314848	Barbados, 50-60 fathoms.....	Henderson.....	20
314847	Barbados, 80 fathoms.....	Henderson.....	Many.
314846	Barbados.....	Henderson.....	18
314845	Barbados, 75 fathoms.....	Henderson.....	22
314858	Barbados, 60 fathoms.....	Henderson.....	1
314857	Barbados, 75-80 fathoms.....	Henderson.....	12
314856	Barbados, 35-75 fathoms.....	Henderson.....	2
314859	Barbados, 30-70 fathoms.....	Henderson.....	1
314860	Barbados, 25-72 fathoms.....	Henderson.....	19
314861	Barbados, 40 fathoms.....	Henderson.....	14
314862	Barbados, 50-60 fathoms.....	Henderson.....	4

TEREBRATULINA CAILLETI, new variety LATIFRONS.

The valves wider, more or less bilobate, white outside, salmon tinted inside.

Type locality.—Off Barbados in 35 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
314855	Barbados, station 24, 35 fathoms.....	Henderson.....	3
95542	Off Tobago, 880 fathoms.....	B. F.....	3
226293	Mayaguez Harbor, 224 fathoms.....	B. F.....	1

The normal *cailleti* is usually white, but frequently of a reddish color. It is the most abundant West Indian species. It is possible that the young individual from the Grand Banks may be the immature form of another species.

TEREBRATULINA PHOTINA, new species.

Shell small, ovate, white, rather compressed, showing no indications of a fold anteriorly; surface smooth, only showing fine radial striae under a lens; punctation dense and conspicuous; pedicel valve with a small short rather pointed beak, a wide incomplete foramen and small deltidial plates; hinge teeth small, rather adjacent, not propped; there are three faint radial furrows in the depth of the valve but no septum; the pedicel "collar" is short and strong, with a free edge; brachial valve subcircular, with narrow cardinalia and a squarish hingeplate with a small concave medial process; loop long, narrow,

complete, the lower portion produced into a conspicuous point medially. Length of shell 15; width 12; diameter 5.5 mm.

Type locality.—U. S. Bureau of Fisheries, station 5586, in 347 fathoms, mud, bottom temperature 44° F., in Sibuku Bay, Borneo, off Sipadan Island.

Cat. No.	Locality.	Collector.	Number of specimens.
299274	Tawitawi Islands., Philippine Islands., 340 fathoms	B. F.	1
299346	Tawitawi Islands., Philippine Islands., 340 fathoms	B. F.	1½
300278	Celebes, 540 fathoms.....	B. F.	1 v.
291010a	Celebes, 540 fathoms.....	B. F.	1
299741	Borneo (types), 347 fathoms.....	B. F.	3

If it were not for the complete loop this species would certainly be taken for a *Gryphus*. The striation is so fine and faint that it is invisible without magnification. With the cardinalia complete it can not be mistaken for any other species of *Terebratulina*.

TEREBRATULINA RADULA Hedley.

Terebratulina radula HEDLEY, Proc. Linn. Soc. N. S. W., vol. 29, p. 209, pl. 10, figs. 48-50, 1904.

Type locality.—East of Wollongong, Australia, in 100 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
335706	Off Narrabeen, New South Wales, 80 fathoms.	Hedley.....	7

Genus GRYPHUS Megerle von Mühlfeldt.

Gryphus MEGERLE, Mag. d. Ges. Naturf. freunde zu Berlin, 5ter Jahrg., 1811, p. 64.—DALL., Bull. U. S. Nat. Mus. No. 8, p. 70, 1877. Not *Gryphus auctorum* as of BRISSON, 1760, in error. Not *Gryphus* Oken, 1816.

Terebratula LAMARCK, Hist. Anim. s. Vert., vol. 6, pt. 1, p. 245, 1819.

Liothyris DOUVILLÉ, Bull. Soc. Géol. de France, sér. 3, vol. 7, p. 265, 1879; not of Conrad, Geol. Rep. N. Carolina, App. p. 9, 1873.

Liothyrina OEHLERT in Fischer, Man. de Conchyl., p. 1316, 1887.

Type.—*Anomia vitrea* Born.

The name *Gryphus* Megerle has been rejected by authors on the ground that it was preoccupied by an alleged genus *Gryphus* of Brisson in his work on birds. This, however, is due to an error. Brisson described no genus *Gryphus* but used the word as a *specific* name for the Condor, one of the species of his genus *Vultur* (p. 28). Hence the brachiopod name is not, in a generic sense, preoccupied by its occurrence (p. 473) in Brisson's Ornithologia. The name has been used by

several authors in a generic sense later, but except in the case of the Museum Calonnianum, all are subsequent to Megerle. The Museum Calonnianum has been rejected as a source of valid nomenclature by the International Committee on Nomenclature, but in any case it did not originally contain the name *Gryphus* which at some later date was written in as a substitution for *Lacinia* in some copies. There is no way of determining the date of this manuscript emendation, which in any case could not be accepted, since the circulation of a manuscript does not constitute publication.

GRYPHUS VITREUS Born.

Anomia seu Terebratula minorica HERBIGNY, Dict. Hist. Nat., vol. 1, p. 80, 1775; (not a binomial work.)

Anomia vitrea BORN, Index Mus. Vind., p. 106, 1778; Test. Mus. Vind., p. 119, 1780.—GMELIN, Syst. Nat., vol. 4, p. 3347, 1792.

Terebratula vitrea LAMARCK, Système, p. 139, 1801, Anim. s. Vert., vol. 6, pt. 1, p. 245, 1819.

Gryphus vitreus MEGERLE, Mag. d. Ges. Naturf. freunde zu Berlin, 5ter Jahrg., 1811, p. 64.

Liothyris vitrea DOUVILLÉ, Bull. Soc. Géol. de France, sér. 3, vol. 7, p. 265, fig. 6, 1879.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 6, pl. 1, figs. 1-12, 1886.

Liothyrina vitrea OEHLERT, in Fischer, Man. de Conchyl., p. 1316, fig. 1104, 1887.

Terebratula (Liothyrina) vitrea FISCHER and OEHLERT, Expl. du Travailleur et du Talisman, p. 51, pl. 3, figs. 7 a-b, 1891.

Type locality.—Port Mahon, Island of Minorca, Mediterranean Sea.

Cat. No.	Locality.	Collector.	Number of specimens.
109745	Mediterranean.....	Ital. Exp.....	1
32926	Naples.....	Dr. Newberry.....	1
110849	Mediterranean.....	Dall.....	1
11884	Mediterranean.....	Damon.....	2
17816	Mediterranean.....	Jeffreys.....	2
6804	Mediterranean.....	Jeffreys.....	1
21949	Mediterranean.....	Crosse.....	1
274163	Mediterranean.....	S. Smith.....	1
109740	Mediterranean.....	Issel.....	1
109791	Bay of Naples.....	Dohrn.....	8
109734	Bay of Naples.....	Tiberi.....	5
109725	Adventure Bank, 92 fathoms.....	Porcupine Exp.....	2
109726	Adventure Bank, 120 fathoms.....	Shearwater Exp.....	3
109727	Algerine coast, 1,456 fathoms.....	Porcupine Exp.....	3
109724	Morocco coast, 207 fathoms.....	Porcupine Exp.....	6
109728	Corsica.....	Susini.....	1
109730	Sardinia.....	Tiberi.....	4
109770	Sardinia.....	Tiberi.....	3
109731	Sardinia.....	Tiberi.....	8
109732	South of Sicily, 266 fathoms.....	Porcupine Exp.....	6
109735	Pantellaria, 40 fathoms.....	Capt. Nares.....	1
109736	Tunis, 100 fathoms.....	Capt. Nares.....	1
109738	Benzert Roads, Tunis, 50 fathoms.....	Carpenter.....	15
109739	Benzert Roads, Tunis, 310 fathoms.....	Capt. Spratt.....	Fr.
109729	Mediterranean.....	Italian Exp.....	1
109741	Station 22, 200 fathoms.....	Italian Exp.....	1
109742	Station 22, 400 fathoms.....	Italian Exp.....	1

Cat. No.	Locality.	Collector.]	Number of specimens.
109743	Station 21. 800 fathoms.	Italian Exp.	1
109744	Station II.	Italian Exp.	1
109711	West of Portugal, 220 fathoms.	Porcupine Exp.	1
109712	West of Portugal, 994 fathoms.	Porcupine Exp.	1
109713	West of Portugal, 1,095 fathoms.	Porcupine Exp.	3
109715	South of Portugal, 292 fathoms.	Porcupine Exp.	10
130334	Gulf of Cadiz, 224 fathoms.	Travailleur.	4 Fr.
109717	South of Portugal, 364 fathoms.	Porcupine Exp.	15
109716	West of Portugal, 374 fathoms.	Porcupine Exp.	1
109718	South of Portugal, 322 fathoms.	Porcupine Exp.	5
109719	Off Southwest Spain, 304 fathoms.	Porcupine Exp.	3
109720	Off Southwest Spain.	Porcupine Exp.	Fr.
109721	Off Southwest Spain, 227 fathoms.	Porcupine Exp.	1
109722	Capo de Gata, 69 fathoms.	Porcupine Exp.	1
109723	Off Cape Sagres.	Porcupine Exp.	1

GRYPHUS VITREUS var. ELONGATUS Jeffreys.

109755	Sardinia.	Tiberi.	2
109743	Sardinia.	Tiberi.	2

GRYPHUS VITREUS var. DILATATUS Jeffreys.

109756	Sardinia.	Tiberi.	4
109769	Sardinia.	Tiberi.	3

The two varieties above mentioned certainly differ enough from the normal shell to receive varietal names. It is curious that both should have come from Sardinia. The *elongatus* is narrow almost subcylindrical, and as there are four specimens of it, it can hardly be regarded as a deformity. The other variety, *dilatatus*, is lenticular, subcircular and much less inflated than the normal *vitreus*. If found in another faunal area one could hardly hesitate to regard it as a new or at least a distinct species. Except in form they do not appear to differ from normal *vitreus*. The varietal names used above were attached to the specimens by Jeffreys, but I have not found that they have been published.

GRYPHUS AFFINIS Calcare.

Terebratula vitrea var. *minor* PHILIPPI, En. Moll. Sicil., vol. 1, p. 99, pl. 6, fig. 8, 1836.

Terebratula minor SUESS, Wohns. d. Brach. 1859, not of Nilsson, Petr. Suecica, 1827.

Terebratula affinis CALCARE, Cenzo Moll. viv. e foss. di Sicilia, p. 48, 1845.—SEGUENZA, Sulla form, Mioc. di Sicilia, p. 7, 1862.

Terebratula vitrea var. *minor* DAVIDSON, Mon. Rec. Brach., pt. 1, p. 9, pl. 1, fig. 13, 1886.

Liothyryna affinis BLOCHMANN, Zeitschr. f. Wiss. Zool., vol. 90, p. 605, text fig. 1, pl. 36, fig. 8, 1908.

Type locality.—Lipari Islands, Mediterranean.

Cat. No.	Locality.	Collector.	Number of specimens.
110850	Mediterranean.....	Davidson.....	1
109750	Lipari Ids.....	Tiberi.....	10
109752	Gulf of Naples.....	Tiberi.....	1
109753	Gulf of Naples.....	Acton.....	1
109758	Gulf of Naples.....	Tiberi.....	7
109760	Gulf of Naples, 72 fathoms.....	Acton.....	6
109762	Gulf of Naples (young).....	Tiberi.....	1
109749	Sardinia.....	Tiberi.....	6
109754	Adriatic.....	Stossich.....	2
109764	Sicily.....	Benoit.....	2
109757	Adventure Bank.....	Carpenter.....	1
109759	Adventure Bank, 130 fathoms.....	Carpenter.....	35
109765	Skerke Bank, 120 fathoms.....	Carpenter.....	7
109763	Benzert Roads, Tunis, 100 fathoms.....	Carpenter.....	10
109761	Villa Franca, Azores, 699 fathoms.....	Josephine Exp.....	1
108252	Off Georgia, 440 fathoms.....	B. F.....	2v.
108216	Off Fernandina, Fla., 294 fathoms.....	B. F.....	2v.

The distinctness of this species, which is also found in the Italian Tertiary, has been confirmed by Blochmann. The American specimens want the loop and are only tentatively placed here.

GRYPHUS JOLOENSIS, new species.

Shell rounded triangular, widest at the anterior third, smooth except for concentric lines of growth, not folded; beak high, incurved and conspicuous with a large entire foramen, the deltidial plates small and narrow, coalescent; hinge margin thickened, longer than the short stout teeth, anterior margin smooth, muscular impressions obscure; brachial valve less inflated, dental plates wide, the sockets faintly cross striated, the loop short, rather wide, the lower portion with a median deep sulcus behind and a corresponding projection in front, the crura short and blunt; the plates are separated to the apex where there is a prominent callosity serving as cardinal process; the front edge of the valves is nearly straight. Height of pedicel valve 17, maximum breadth 14, diameter 7 mm.

Type locality.—United States Bureau of Fisheries station 5172, in 318 fathoms, off Jolo, Philippine Islands.

Cat. No.	Locality.	Collector.	Number of specimens.
111062	Off Jolo, 318 fathoms.....	B. F.....	2
111066	Off Tawitawi Ids., 230 fathoms.....	B. F.....	1
111063	Philippine Ids., 105 fathoms.....	B. F.....	1

Though without any very striking characters I can not unite this with any of the related species.

GRYPHUS BORNEOENSIS, new species.

Shell large, yellowish white, with tinges of brown, inflated, broadly and squarely folded anteriorly; apparently smooth but showing under a lens fine radial threads with wider interspaces and conspicuous, not very dense punctation; pedicel valve with a moderate entire foramen, the beak so strongly incurved as to hide entirely the narrow concave, coalescent deltidial plates, which in loose valves show more or less prominently four or more threadlike cross ridges mesially obsolete; there is a well marked "collar" inside the foramen; the muscular scars are well impressed; the brachial valve has wide concave crural plates well divided to the apex where there is a small but prominent cardinal process; the hinge teeth are small, the crura triangular and short, the loop short, widening forward, the lower part without a posterior sulcus, slightly medially ridged, angular and sharply pointed at the anterior corners, but with no medial projection, a short threadlike ridge divides the slightly impressed muscular scars; the anterior edge has a squarish not very deep indentation for the projection of the pedicel valve. Height of shell 41; width 33; diameter 25 mm. U. S. Nat. Mus. Cat. No. 229297.

Type locality.—South of Silungan Island, Sibuko Bay, Borneo, at Station 5592, in 305 fathoms, bottom temperature 43° 3 F.

Cat. No.	Locality.	Collector.	Number of specimens.
229297	Sibuko Bay, 305 fathoms.....	B. F.....	1½
239287	Molucca Pass, 272 fathoms.....	B. F.....	1v.
238396	Jolo Sea, 508 fathoms.....	B. F.....	1v.

This species recalls *G. bartletti* Dall, but is wider and more rounded, with a wider and less emphatic fold, and there are small differences in the form of the loop. The young shell, judging by the incremental lines, is subcircular or even a little wider than high.

GRYPHUS BARTLETTI Dall.

Terebratula bartlettii DALL, Amer. Naturalist, vol. 16, p. 885, Nov., 1882; Bull. Mus. Comp. Zool., vol. 12, No. 6, pp. 200-201, pl. 6, fig. 4a-c, 1886.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 14, pl. 1, figs. 20-21. 1886.

Type locality.—Barbados, 73 fathoms, Captain Bartlett.

Cat. No.	Locality.	Collector.	Number of specimens.
110852	Barbados, 73 fathoms.....	Bartlett.....	1
64263	West Florida, 100 fathoms.....	Blake.....	1
103222	South of Cuba, 254 fathoms.....	B. F.....	1
64257	Off Montserrat, 88 fathoms.....	Blake.....	5½
64259	Off Montserrat, 120 fathoms.....	Blake.....	1
64258	Off Grenada, 164 fathoms.....	Blake.....	2
64260	Off Grenada, 92 fathoms.....	Blake.....	1
64261	Off Grenada, 164 fathoms.....	Blake.....	1
64262	Off St. Kitts, 250 fathoms.....	Blake.....	1

A large number of other localities are recorded in my *Blake* Report above cited, which are represented by specimens in the Museum of Comparative Zoology at Harvard University. This species ranges in color from white to salmon-color.

GRYPHUS CUBENSIS Pourtales.

Terebratulula cubensis POURTALES, Bull. Mus. Comp. Zool., vol. 1, No. 6, p. 109, Dec. 1867.—DALL, Mus. Comp. Zool., vol. 3, p. 3, pl. 1, figs. 2, 8-15, 1871.—DAVIDSON, *Challenger* Brach., p. 28, pl. 2, figs. 10, 11, 1880.

Terebratulula vitrea var. *sphenoidea* JEFFREYS, Proc. Zool. Soc., 1878, p. 404, pl. 22, fig. 6 (*ex parte*) not of Philippi.

Lyothyrus sphenoidea DAVIDSON, Mon. Rec. Brach., pt. 1, p. 12 (*ex parte*), pl. 2, figs. 19 a-b, 21, 22, 1886.

Type locality.—Off Havana, Cuba, in 270 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
109768	Gulf of Mexico.....	Pourtales.....	1
109747	Gulf of Mexico.....	Pourtales.....	2
109748	Gulf of Mexico.....	Pourtales.....	10
110854	Florida Strait, 400 fathoms.....	Stearns.....	11
107524	Florida Strait, 200 fathoms.....	Nutting.....	2
110856	Florida Strait.....	B. F.....	9
110857	Florida Keys.....	B. F.....	1
274164	Off Sambo reef, 120 fathoms.....	Henderson.....	6
274165	Off Sambo reef, 118 fathoms.....	Henderson.....	2
187238	Off Key West, 122 fathoms.....	B. F.....	2
274167	Off Key West, 75 fathoms.....	Henderson.....	1
187237	Off Key West, 122 fathoms.....	B. F.....	5
193545	Off Key West, 120 fathoms.....	B. F.....	1
87351	Off Fernandina, 294 fathoms.....	B. F.....	1
274166	Off Western dry reefs, 144 fathoms.....	Henderson.....	6
87378	Off Little Bahamas, 338 fathoms.....	B. F.....	8
110855	Off Cuba, 2,690 fathoms.....	B. F.....	1
64249	Off Havana, 400 fathoms.....	Blake.....	1
64248	Off Havana, 119 fathoms.....	Blake.....	10
193567	Off Havana, 279 fathoms.....	B. F.....	1
211014	Off Havana, 387 fathoms.....	B. F.....	1
226290	Mayaguez, Porto Rico, 224 fathoms.....	B. F.....	15
64264	Off Guadeloupe, 175 fathoms.....	Blake.....	1
64251	Off St. Vincent, 88 fathoms.....	Blake.....	2
64250	Off Montserrat, 88 fathoms.....	Blake.....	1

The specific distinction of this species from *G. vitreus*, *sphenoideus*, and others, which I affirmed in 1871, has been amply confirmed by the researches on its spiculation by Doctor Blochmann.

GRYPHUS SUBQUADRATUS Jeffreys.

Terebratula subquadrata JEFFREYS, Proc. Zool. Soc., 1878, p. 402, pl. 22, fig. 3.

Liothyris subquadrata DAVIDSON, Mon. Rec. Brach., pt. 1, p. 14, pl. 2, figs. 15, 16, 1886.

Type locality.—Off the Setubal coast of Portugal near the mouth of the Tagus River, in 500 to 600 fathoms; Saville Kent.

Cat. No.	Locality.	Collector.	Number of specimens.
130336	Off Setubal, 5-600 fathoms.....	S. Kent.....	1
130337	Off Setubal, 5-600 fathoms.....	Davidson.....	2
130338	Bay of Biscay.....	Travailleur.....	1

Remarkable for its widely spaced, minute, but sharp radiating threads.

GRYPHUS SPHENOIDEUS Philippi.

Terebratula sphenoidea PHILIPPI, En. Moll. Sicil., vol. 2. p. 67, pl. 18, fig. 6, 1844.

Terebratula vitrea var. *sphenoidea* JEFFREYS (*ex parte*) Proc. Zool. Soc., 1878, p. 404, pl. 22, fig. 6.

Liothyris sphenoidea DAVIDSON, Mon. Rec. Brach., pt. 1, p. 12, pl. 2, figs. 17, 18 (only) 1886. (*L. cubensis* synonyms excluded).

Type locality.—For the original fossil; Pliocene of Lamanto, Calabria, Italy. For the recent shell; west of Portugal in 374 fathoms, *Porcupine* Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
109701	West of Portugal, 274 fathoms.....	<i>Porcupine</i> Exp.....	3
109700	West of Portugal, 292 fathoms.....	<i>Porcupine</i> Exp.....	1½
109699	Bay of Biscay, 277 fathoms.....	<i>Travailleur</i>	1
130235	Bay of Biscay, 277 fathoms.....	<i>Travailleur</i>	2
109767	Josephine Bank, 200 fathoms.....	Italian Exp.....	1

No. 109700 exhibits a few microscopic threads laterally, resembling those of *G. subquadratus*. I do not feel altogether satisfied that the recent specimens collected by Jeffreys are identical with the Pliocene fossils although they are certainly quite similar. The latter average larger and more inflated and have a much thicker and more solid shell, judging by a large series received from Seguenza.

GRYPHUS ARCTICUS Friele.

Terebratula arctica FRIELE, Nyt. Magazin for Naturvidenskaberne, 1877 (Separate copies, p. 1) pl. 1, figs. 1 a-c.

Liothyryna arctica DAVIDSON, Mon. Rec., Brach., pt. 1, p. 10, pl. 1, figs. 17, 18, 1886.

Type locality.—Station 237 of the Norwegian North Atlantic expedition. Southwest of Jan Mayen Island in 263 fathoms, bottom temperature 33° F.

Cat. No.	Locality.	Collector.	Number of specimens.
109798	Off Jan Mayen, 263 fathoms	Friele	2
202602	Off southeast Greenland, 108 fathoms	Wallich	1

GRYPHUS ANTARCTICUS Blochmann.

Liothyryna antarctica BLOCHMANN, Zool. Anz., vol. 30, 1906, pp. 692-699, fig. 3; Zeitschr. f. wiss. Zool., vol. 90, 1908, p. 614.—EICHLER, Brach. Deutsche Sud Polar Exped. Zool., vol. 4, p. 89, pl. 42, figs. 1-4; pl. 43, figs. 13, 19, 20; pl. 44, figs. 25-34, 1911.

Liothyrella antarctica JACKSON, Brit. Antarctic Exp. Brachiopoda, p. 103, 1918.—THOMSON, Austral. Antarctic Exp. Zool., vol. 4, pt. 3, p. 16, pl. 15, figs. 8, 9; pl. 18, figs. 65, 66, 1918.

Type locality.—Near the wintering station of the Gauss party, Kaiser Wilhelm's Land in 209 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
110441	Kaiser Wilhelm's Land, 209 fathoms	Gauss Exp.	1

Owing to the extreme inconstancy in the same species among specimens from the same locality of the so-called dorsal septum in these *Terebratulas* I hesitate to assign this feature any systematic value. None of my specimens of *G. uva* show it except as a thickening so trifling that it does not interrupt the passage over it of the point of a pin.

GRYPHUS FULVA, Blochmann.

Terebratula uva (ex parte) DAVIDSON, Challenger Brach., pp. 31-2, pl. 2, figs. 3-4, 1880; not of Broderip.

Liothyryna fulva BLOCHMANN, Zool. Anz., vol. 30, p. 698, 1906; Zeitschr. f. Wiss. Zool., vol. 90, p. 617, pl. 38, fig. 22a-b; pl. 39, fig. 26, 1908; Proc. Roy. Soc. Tasmania for 1913, p. 112, pl. 10, figs. 1-6; pl. 12, figs. 12a-b, 1914.

Liothyrella fulva ALLAN THOMSON, Brach. Austr. Antarctic Exp., p. 14, pl. 15, figs. 20-22; pl. 17, fig. 53, 1918.

Type locality.—Twofold Bay, Tasmania, 600 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
335703	Cabo Island, New South Wales, 115 fathoms..	Hedley.....	2
333011	Off Cape Everard, 90-150 fathoms.....	Hedley.....	3

GRYPHUS UVA Broderip.

Terebratula uva BRODERIP, Proc. Zool. Soc. 1833, p. 124; Trans. Zool. Soc. Lond., vol. 1, p. 142, pl. 22, fig. 2, 1833.—SOWERBY, Thesaurus, vol. 1, p. 353, pl. 70, figs. 53-55, 1847.—REEVE, Conch. Icon., *Terebratula*, pl. 3, fig. 11, 1860.

Liothyrina uva DALL, Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 443, 1903.

Type locality.—Gulf of Tehuantepec, in 10-12 fathoms, sandy bottom. Captain Dare.

Cat. No.	Locality.	Collector.	Number of specimens.
110851	Guayaquil.....	Martens.....	1
223628	Gulf of Panama, 1,175 fathoms.....	B. F.....	1

The specimen from deep water was dead and contained mud, when dredged. The true *G. uva* is a shallow water species. I have seen none from south of Peru. I strongly suspect that more than one species is involved in Davidson's discussion of *T. uva* both in the *Challenger* report and his monograph.

The genital sinuses in *G. uva* are reticulate and occupy the middle third of the valve with a vacant space mesially. The "septum" in the dorsal valve, in the specimens I have been able to examine, is extremely feeble, and often absent altogether. Something of the kind may be found in some specimens of almost any *Terebratuloid*, as for instance *G. vitreus*.

GRYPHUS MOSELEYI Davidson.

Terebratula moseleyi DAVIDSON, Proc. Roy. Soc., vol. 27, p. 436, 1878; *Challenger* Brach., p. 30, pl. 2, figs. 12-14, 1880.

Liothyris moseleyi DAVIDSON, Mon. Rec., pt. 1, p. 11, pl. 2, figs. 1-4, 1886.

Liothyrina moseleyi DALL, Bull. Mus. Comp. Zool., pt. 43, No. 6, p. 443, 1908.

Type locality.—West of Kerguelen Island, at a depth of 210 fathoms, *Challenger* Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
110853	Off New Jersey, 1,362 fathoms.....	B. F.....	1
64255	Off Martinique, 169 fathoms.....	Blake.....	1
110887	Gulf of Panama, 134 fathoms.....	B. F.....	7 v.

No. 64255 was submitted to Mr. Davidson and pronounced to be his *T. moseleyi*, agreeing very closely with his figures in the *Challenger* report. The other specimens appear to be conspecific, though the Panama specimens are dead and dilapidated valves. The older specimens show three marked short grooves separated by the muscular impressions which are more or less raised, in the pedicel valve, and in senile specimens these are quite deep.

There has been some doubt expressed as to the identity of the above specimens with the species dredged at Kerguelen, notwithstanding their agreement in the external features. I confess to some doubt myself and would suggest for the species in case they prove distinct the name of *Gryphus martinicensis*, the specimen numbered 64255 being taken as type.

GRYPHUS TOKIONIS, new species.

Terebratula? DAVIDSON, Proc. Zool. Soc., 1871, p. 312, pl. 31, fig. 6.

Type locality.—U. S. Bureau of Fisheries station 3661, in the Gulf of Tokio, Japan, in 169 fathoms, mud, bottom temperature 48° F.

Cat. No.	Locality.	Collector.	Number of specimens.
107731	Gulf of Tokio, 169 fathoms	B. F.	1
204669	Off Hondo Island, 302 fathoms.....	B. F.	1

The brachial valve is subcircular, the loop short, rather wide, the parts narrow, the lower portion slightly elevated mesially, the anterior corners angular and sharply pointed, the crura short and blunt, the plates deeply excavated, completely separated with a small prominent rugose cardinal process. There is a faint ridge between the muscular impressions, in the brachial valve, and another in the pedicel valve. The exterior is smooth, the foramen entire, there is a well marked "collar" within the foramen.

Mr. Davidson had a specimen of this species which he figured in his paper on Japanese brachiopods above cited. He did not describe it because the cardinalia were defective and he was doubtful about the genus. I have seen no subsequent reference to it.

GRYPHUS DAVIDSONI A. Adams.

Terebratula davidsoni A. ADAMS, Proc. Zool. Soc., 1867, p. 314, pl. 19, fig. 30.

Terebratula minor Davidson, Proc. Zool. Soc., 1871, p. 302, pl. 30, fig. 10; not of Philippi, 1836.

Liothyris vitrea var. *davidsoni*, DAVIDSON, Mon. Rec. Brach., pt. 1, p. 9, pl. 1, figs. 14-16, 1886.

Type locality.—Satanomosaki, Japan, 55 fathoms. A. Adams.

Cat. No.	Locality.	Collector.	Number of specimens.
110789	Korea Strait, 59 fathoms.....	B. F.....	1
110790	Korea Strait, 59 fathoms.....	B. F.....	1
110791	Kagoshima Gulf, Japan, 103 fathoms.....	B. F.....	1

This little species occupies a position in relation to the other brachiopods in the Japanese fauna analogous to that of *Gryphus minor* Philippi (*G. affinis* Calcara) in the Mediterranean fauna, but there seems to be no basis, except a general superficial similarity, for regarding them as identical.

GRYPHUS TRANSLUCIDUS, new species.

Shell small, white, smooth, polished, subtransparent, rounded triangular, moderately inflated; pedicel valve with a short beak, entire foramen, the deltidial plates narrow, coalescent, with a median suture; hinge teeth weak, close together; brachial valve less convex, the loop short, small, the anterior edge taken with the edges of the very short crura, describing two thirds of a circle, with no median ridge, sulcus or projecting point; crural plates separated to the apex with no trace of a cardinal process; two short shallow grooves in the valve below the loop separate the muscular impressions. Height 7.0, width 5.5, diameter 4.0 mm.

Type locality.—U. S. Bureau of Fisheries stations 5153, Tawitawi Islands, in 49 fathoms, sand, and 5236, off Nagubat Island, East Mindanao, Philippines, in 494 fathoms, sand, bottom temperature 41.2° F.

Cat. No.	Locality.	Collector.	Number of specimens.
294903	Off Nagubat Island, 494 fathoms.....	B. F.....	6
300660	Off Cagayan Island, 495 fathoms.....	B. F.....	2
291085	Off Dammi Island, Sulus, 243 fathoms.....	B. F.....	1v.
295780	Off East Mindanao, 171 fathoms.....	B. F.....	1
291227	Off Sibutu Island, Sulus, 175 fathoms.....	B. F.....	1v.
292374	Off Tablas Island, 73 fathoms.....	B. F.....	2v.
292931	Off Tawitawi Islands, 49 fathoms.....	B. F.....	1
299330	Off Tawitawi Islands, 340 fathoms.....	B. F.....	5
291160	Off Sibuko Bay, Borneo, 292 fathoms.....	B. F.....	1
291010	Gulf of Boni, Celebes, 540 fathoms.....	B. F.....	6
300318	Gulf of Boni, Celebes, 700 fathoms.....	B. F.....	1v.

This little species resembles no other yet described recent form and there is no indication that it reaches much greater dimensions than those given above. Notwithstanding the number of specimens none retained the brachia, No. 292931 alone had the space below the

loop covered by a densely spiculose membrane. The genital sinuses were imperceptible.

GRYPHUS WYVILLI Davidson.

Terebratula wyvillii DAVIDSON, Proc. Roy. Soc., vol. 27, p. 436, 1878.

Terebratula wyvillii DAVIDSON, *Challenger* Brach., p. 27, pl. 2, figs. 7-9, 1880.

Lyothyris wyvillii DAVIDSON, Mon. Rec. Brach., pt. 1, p. 15, pl. 2, figs. 8-14, 1886.

Lyothyrina wyvillii DALL, Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 444, 1908.

Type locality.—As Davidson appears to have selected no special locality among those he enumerates in the *Challenger* Report, I choose station 299, off Valparaiso, Chile, in 2,160 fathoms, gray mud, bottom temperature 34° F.

Cat. No.	Locality.	Collector.	Number of specimens.
110745	Southwest of Galapagos Islands, 2,030 fathoms	B. F.	3

This should not be confused with *Waldheimia wyvillii* dredged by the *Challenger* in the same haul, or *Terebratulina (Dyscolia) wyvillii* both described by Davidson. The brachia though very short exhibited both median and lateral coils.

GRYPHUS CLARKEANA Dall.

Liothyrina clarkeana DALL, Proc. U. S. Nat. Mus., vol. 17, p. 718, pl. 31, figs. 9, 10, 1895; Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 443, Oct., 1908.

Type locality.—Gulf of Panama, 1,175 fathoms, U. S. Bureau of Fisheries, bottom temperature 36° 8 F.

Cat. No.	Locality.	Collector.	Number of specimens.
107275	Gulf of Panama, 1,175 fathoms.	B. F.	1
110742	Southwest of Galapagos Islands, 2,035 fathoms	B. F.	1

Only these two specimens are yet known.

Section CNISMATOCENTRUM Dall.

Crural plates appressed solidly to the valve below the dental plates, the loop thus appearing to spring from the valve instead of from the hinge; a short median ridge below the loop.

Type.—*Gryphus sakhalinensis* Dall.

GRYPHUS SAKHALINENSIS Dall.

Terebratula (Liothyris) sakhalinensis DALL, Nautilus, vol. 22, No. 3, 1908, p. 28.

Type locality.—Okhotsk Sea, off the southeast coast of Sakhalin Island, in 64 to 100 fathoms, bottom temperature 30° F.

Cat. No.	Locality.	Collector.	Number of specimens.
110786	Southeast coast Sakhalin, 64 fathoms	B. F.	2
110787	Southeast coast Sakhalin, 64 fathoms	B. F.	1
10788	Southeast coast Sakhalin, 100 fathoms	B. F.	1
222598	Chignik Bay, Alaska, 60 fathoms.....	B. F.	2

This very remarkable species has the genital sinuses reticulate, rather behind the middle of the valve, and occupying for so large a shell relatively small space. The cardinal process is small but very prominent. The whole shell is much more solid than most *Terebratuloids*; it has a few obsolete radial striae on each side, and a very regular, conspicuous, and close system of punctation. The spiculation is not visible under an ordinary hand lens. All the specimens are of a brownish color.

Genus *DYSCOLIA* Fischer and Oehlert.

Dyscolia FISCHER and OEHLERT, Journ. de Conchyl., vol. 38, p. 70, 1890; Exp. Sci. du Travailleur et du Talisman, p. 18, Sept. 1891, type, *Terebratulina wyvillii* Davidson.

DYSCOLIA WYVILLI Davidson.

Terebratulina wyvilli DAVIDSON, Proc. Roy. Soc., vol. 27, p. 436, 1878.

Terebratulina wyvillii DAVIDSON, *Challenger* Brach., p. 32, pl. 1, figs. 1-2, 1880; Mon. Rec. Brach., pt. 1, p. 32, pl. 3, figs. 1-3, 1886.

Dyscolia wyvillei FISCHER and OEHLERT, Journ. de Conchyl., vol. 38, p. 70, 1890; Bull. Soc. Zool. de France, vol. 4, p. 120, 1890; Exp. Sci. du Travailleur et du Talisman, p. 23, fig. 1, pl. 6, figs. 3 a-e, 1891.

Terebratula asturiana FISCHER, Ms. in Jeffreys Collection.

Type locality.—Off Culebra Island, northwest of St. Thomas, West Indies, at station 24 in 390 fathoms sand.

Cat. No.	Locality.	Collector.	Number of specimens.
109797	Off Cape Finistère, Spain, 1051 fathoms.....	<i>Talisman</i>	fragm.

Genus *CHLIDONOPHORA* Dall.

Chlidonophora DALL, Trans. Wagner Inst., vol. 3, p. 1538, 1903, type, *Terebratulina incerta* Davidson.

CHLIDONOPHORA INCERTA Davidson.

Megerlia ? *incerta* DAVIDSON, Proc. Roy. Soc., vol. 27, p. 438, 1878; *Challenger* Brach., p. 49, pl. 11, figs. 17-18, 1880.

Terebratulina ? *incerta* DAVIDSON, Mon. Rec. Brach., pt. 1, p. 38, pl. 6, figs. 23-25, 1886.

Chlidonophora incerta DALL, Trans. Wagner Inst., vol. 3, p. 1538, 1903.

Type locality.—Between Sierra Leone, Africa, and the island of Fernando de Noronha, South Atlantic, dredged by the *Challenger* Expedition in 1,850 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
93776	Gulf of Mexico, 1,181 fathoms.	B. F.	46
64254	Off Havana, 292 fathoms.	Blake	3
64252	Off Bequia Island, 1,591 fathoms.	Blake	29
64252a	Off Bequia Island, figd., 1,591 fathoms.	Blake	1
64253	Off Bequia Island, 1,507 fathoms.	Blake	2

CHLIDONOPHORA CHUNI Blochmann.

Chlidonophora chuni BLOCHMANN in Chun, Aus den Tiefen des Weltemeers, vol. 2, p. 435, figs., 1903; Zool. Anz., vol. 30, 1906, p. 695; Zeitschr. f. wiss. Zool., vol. 90, p. 628, 1908.

Type locality.—*Valdivia* Expedition station 219, south of the Maldiv Islands in 1,283 fathoms, bottom temperature 36° F.

Cat. No.	Locality.	Collector.	Number of specimens.
110436	Off the Maldives, 1,283 fathoms.	Valdivia.	1

Genus EUCALATHIS Fischer and Oehlert.

Eucalathis FISCHER and OEHLERT, Journ. de Conchyl., vol. 38, p. 72, 1890; Exp. Sci. du Travailleur et du *Talisman*, p. 40, 1891, type, *E. murrayi* Davidson.

EUCALATHIS MURRAYI Davidson.

Terebratula murrayi DAVIDSON, Proc. Roy. Soc., vol. 27, p. 437, 1878.

Terebratulina murrayi DAVIDSON, *Challenger* Brach., p. 39, pl. 2, figs. 1 a-c, 1880; Mon. Rec. Brach., pt. 1, p. 39, pl. 6, figs. 15-17, 1886.

Eucalathis murrayi FISCHER and OEHLERT, *Talisman* Exp. Brach., p. 40, 1891.

Type locality.—*Challenger* station 171, south of the Fiji Islands in 600 fathoms. Bottom temperature 37° 3 F.

Cat. No.	Locality.	Collector.	Number of specimens.
110848	Off Havana, 292 fathoms.	Blake.	1

EUCALATHIS TUBERATA Jeffreys.

Terebratula tuberata JEFFREYS, Proc. Zool. Soc., 1878, p. 401, pl. 22, fig. 2.

Terebratulina tuberata DAVIDSON, *Challenger* Brach., p. 13, 1880; Mon. Rec. Brach., pt. 1, p. 39, pl. 6, figs. 18-20, 1886.

Eucalathis tuberata FISCHER and OEHLERT, Expl. Sci. du Travailleur et du *Talisman*, p. 43, pl. 2, figs. 5 a-f, 1891.

Type locality.—Josephine Bank, off Gibraltar, in 340 to 430 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
130341	Off the Sahara, 1,250 fathoms.....	<i>Talisman</i>	1
130342	Bay of Biscay, 1093 fathoms.....	<i>Travailleur</i>	1v
130343	Josephine Bank, 357 fathoms.....	Ital. Exped.....	2
130344	North of Azores, 1,496 fathoms.....	<i>Talisman</i>	1

‡ EUCALATHIS TRIGONA Jeffreys.

Terebratula trigona JEFFREYS, Proc. Zool. Soc., 1878, p. 402, pl. 22, figs. 3, 3a.

Terebratulina trigona DAVIDSON, Mon. Rec. Brach., pt. 1, p. 40, pl. 6, figs. 21, 22, 1886.

Type locality.—Off Portugal coast in 500 fathoms. Kent.

Cat. No.	Locality.	Collector.	Number of specimens.
130345	Off Portugal, 500 fathoms.....	Kent.....	1
130346	Bay of Biscay, 1,009 fathoms.....	<i>Travailleur</i>	3

EUCALATHIS ERGASTICA Fischer and Oehlert.

Eucalathis ergastica FISCHER and OEHLERT, Journ. de Conchyl., vol. 38, p. 73, 1890, Exp. Sci. du *Travailleur* et du *Talisman*, p. 48, pl. 3, figs. 6 a–g, 1891.

Type locality.—Off Cape Finistère, Spain, in 1,051 fathoms, *Travailleur* Expedition of 1881.

Cat. No.	Locality.	Collector.	Number of specimens.
130347	W. st of the Sahara, 346 fathoms.....	<i>Talisman</i>	3

Family MEGATHYRIDAE.

‡ Genus GWYNIA King.

Terebratula JEFFREYS, Ann. Mag. Nat. Hist., ser. 3, vol. 2, p. 125, 1859.

Gwynia KING, Proc. Dublin Univ. Zool.-Bot. Assoc., vol. 1, p. 258, figs. 1–5, 1859.

Terebratula REEVE, Conch. Icon. *Terebratula*, pl. 10, fig. 39, 1861.

Argiope JEFFREYS, British Conch., vol. 2, p. 21, 1863; vol. 5, p. 164, pl. 19, figs. 5, 1869; Proc. Zool. Soc., 1878, p. 410.

Gwynia DAVIDSON, Mon. Rec. Brach., pt. 2, p. 150, 1887.

Type.—*Gwynia capsula* Jeffreys.

GWYNIA CAPSULA Jeffreys.

Terebratula capsula JEFFREYS, Ann. Mag. Nat. Hist., ser. 3, vol. 3, p. 43, pl. 2, figs. 7 a–b, 1859.—REEVE, Conch. Icon., *Terebratula*, pl. 10, fig. 39, 1861.

Gwynia capsula KING, Proc. Dublin Univ. Zool. Bot. Assoc., vol. 1, p. 258, figs. 1–5, 1859.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 150, pl. 21, figs. 28 a–c, 29, 1887.

Argiope capsula JEFFREYS, Brit. Conch., vol. 2, p. 21, 1863; vol. 5, p. 164, pl. 19, fig. 5, 1869; Proc. Zool. Soc. 1878, p. 410.

Type locality.—Larne, County Antrim, Ireland.

Cat. No.	Locality.	Collector.	Number of specimens.
110961	Dublin Bay, 18 fathoms.....	Jeffreys	2
173617	Larne, Ireland.....	Jeffreys	14
173616	Island of Jersey, low water.....	Duprey	40
173611	Island of Jersey.....	Duprey.....	24
173612	Island of Jersey.....	Duprey	6
173619	Island of Guernsey, 20 fathoms.....	Jeffreys.....	12
173613	British Channel.....	France.....	7
173610	County Antrim, Ireland, 25 fathoms.....	Jeffreys.....	3
173615	Port Rush, Antrim, Ireland.....	Waller.....	1
173614	Belfast Bay, Ireland.....	Hyndman.....	1
173618	Fig'd. Brit. Conch., vol. 5, pl. 19, fig. 5.....	Jeffreys	4

Much discussion over this minute species has been had, especially as to whether it is a mature shell. It probably is in a permanently immature stage. Most of the specimens do not show any loop, but I have opened several of the larger ones which had a distinct loop with its lower edge cemented to the valve. I think the species is sufficiently distinct, though very near to *A. cistellula*.

Genus ARGYROTHECA Dall.

Cistella GRAY, Cat. Brit. Mus., p. 114, 1853.—H. and A. ADAMS, Gen. Rec. Moll., vol. 2, p. 581, 1858.—DALL, Bull. Mus. Comp. Zool., vol. 3, No. 1, p. 19, 1871. Not *Cistella* Gistel, Naturg., p. XI, 1848.

Argyrothea DALL, Nautilus, vol. 14, No. 4, Aug., 1900, p. 44.—J. ALLAN THOMSON, Austr. Antarctic Exp., Brachiopoda, p. 6, 1918.

Type.—*Terebratula cuneata* Risso, 1826.

ARGYROTHECA CISTELLULA S. Wood.

Terebratula cistellula S. WOOD, Ann. Mag. Nat. Hist., ser. 1, vol. 6, p. 253, 1841.—REEVE, Conch. Icon., *Terebratula*, pl. 10, fig. 46, 1861.

Argiope cistellula S. WOOD, Suppl. Crag. Moll., p. 170, pl. 11, figs. 4 *a-d*, 1874.—JEFFREYS, Brit. Conch., vol. 2, p. 19, pl. 1, fig. 2, 1863; vol. 5, p. 164, pl. 19, fig. 4, 1869.

Cistella cistellula GRAY, Brit. Mus. Cat. Brach., p. 114, 1853.—DALL, Amer. Journ. Conch., vol. 6, p. 146, 1870; Proc. Acad. Nat. Sci. Phila., for 1873, p. 194.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 139, pl. 22, figs. 1-4, 1887.

Megathyris cistellula FORBES and HANLEY, Brit. Moll., vol. 2, p. 361, pl. 57, fig. 9, 1850.

Type locality.—Fossil in Pliocene of Britain and recent off County Antrim, Ireland, Jeffreys.

Cat. No.	Locality.	Collector.	Number of specimens.
173404	Figd., Brit. Conch., vol. 5, pl. 19, fig. 4.....	Jeffreys.....	6
173405	Figd., Brit. Conch., vol. 2, pl. 7, fig. 2.....	Jeffreys.....	4
173419	Christiansund, Norway.....	Sars.....	1
173415	Kors fiord, Norway.....	Sars.....	10
173406	Zetland.....	Jeffreys.....	13
173407	Shetlands.....	Jeffreys.....	2
173408	Shetlands.....	Jeffreys.....	2
173409	Hebrides.....	Jeffreys.....	3
173410	Skye, 40 fathoms.....	Barlee.....	5
173411	Skye, 40 fathoms.....	Jeffreys.....	28
173412	Skye, 30 fathoms.....	McAndrew.....	2
173413	Exmouth.....	Barlee.....	1
173414	Weymouth.....	Damon.....	1
173415	Weymouth.....	Damon.....	20
173416	Bath Bay.....	Jeffreys.....	4
173420	English Channel.....	France.....	7
173417	Guernsey, 20 fathoms.....	Jeffreys.....	23
173421	Bay of Biscay.....	De Folin.....	2
173422	Sardinia.....	Verany.....	1
173423	Sicily.....	Stefanis.....	3

ARGYROTHECA CUNEATA Risso.

Terebratula cuneata Risso, Hist. Nat. Eur. MÉR., vol. 4, p. 388, pl. 12, fig. 179, 1826.—SOWERBY, Thes. Conch., p. 355, pl. 12, figs. 83, 84, 1846.

Terebratula soldaniana Risso, Hist. Nat. Eur. MÉR., vol. 4, p. 389, pl. 12, fig. 178, 1826.

Anomia pera MÜHLFELDT, Verh. Ges. Naturf. Freunde zu Berlin, vol. 1, p. 205, 1829.

Terebratula pera KÜSTER, Conch. Cab., ed. 2, *Terebratula*, p. 30, pl. 2 b., figs. 14-17, 1848.

Orthis pera PHILIPPI, En. Moll. Sicil., vol. 2, p. 69, vol. 1, p. 96, pl. 6, fig. 13, 1844.—O. G. COSTA, Fauna de Regn. Napoli, p. 37, pl. 3bis, fig. 1, 1851.

Argiope cuneata DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 373, 1852; Proc. Zool. Soc., 1852, p. 81, pl. 14, fig. 27.—SHIPLEY, Mitth. Zool. Sta. Neapl., vol. 4, p. 495, 1883.

Cistella cuneata DALL, Proc. Acad. Nat. Sci. Phila., for 1873, p. 194.—DAVIDSON, Mem. Rec. Brach., pt. 2, p. 141, pl. 22, figs. 30-34, 1887.

Type locality.—Mediterranean, near Nice. Risso.

Cat. No.	Locality.	Collector.	Number of specimens.
110960	Mediterranean.....	Dall.....	1
173477	Mediterranean, 40 fathoms.....	Capt. Nares.....	20
173478	Mediterranean.....	Issel.....	2
173475	Aegean Sea.....	Capt. Nares.....	24
173479	Mediterranean.....	Weinkauff.....	1

Variety PERA Mühlfeldt.

Cat. No.	Locality.	Collector.	Number of specimens.
173474	Spezzia.....	J. Doria.....	4
173473	Zara, Adriatic Sea.....	Jeffreys.....	1
173472	Malta.....	Gibson.....	2
173476	Aegean Sea, 30-200 fathoms.....	Nares.....	4
173469	Tunis, 40-70 fathoms.....	Carpenter.....	30
173470	Sicily.....	Stefanis.....	1

ARGYROTHECA CUNEATA, var. PANTELLARIA Jeffreys.

Cistella pantellaria JEFFREYS, Davidson, Mon. Rec. Brach., pt. 2, p. 142, 1887.

Type locality.—Sicily. Red markings absent.

Cat. No.	Locality.	Collector.	Number of specimens.
173471	Naples.....	Stefanis.....	3

ARGYROTHECA BERMUDANA Dall.

Argyrotheca bermudana DALL, Nautilus, vol. 25, No. 8, Dec. 1911, p. 86.

Cistella cistellula VERRILL, Trans. Conn. Acad., vol. 10, 1900, p. 592, pl. 70, fig. 7; not of Searles Wood.

Type locality.—Bermuda.

Cat. No.	Locality.	Collector.	Number of specimens.
228683	Harrington Sound, Bermuda	Haycock.....	7

This differs from *A. woodwardiana* Davidson of the West Indies in the absence of lateral angles to the hinge-line and of the median sulcation. It has much the form of *A. lunifera* Philippi.

ARGYROTHECA CORDATA Risso.

Terebratula cordata RISSO, Hist. Nat. Eur. MÉR., pl. 4, p. 389, 1826.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 4, vol. 3, p. 375, 1869.—MONTEROSATO, Nomen. Conch. Medit., p. 2, 1884.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 4, vol. 3, p. 375, 1869.

Terebratula neapolitana SCACCHI, Oss. Zool., vol. 2, p. 18, 1833; Cat. Conchyl. Regn. Neap., p. 8, 1836.

Orthis neapolitana PHILIPPI, En. Moll. Sicil., vol. 2, p. 69, 1844.—O. G. COSTA, Fauna Reg. Nap., p. 37, pl. 3, figs. 1, 3, 5, 1851.

Argiope neapolitana DAVIDSON, Proc. Zool. Soc., 1852, p. 81, pl. 14, figs. 24, 25.—KOVALEVSKI, Obs. Dev. Brach. (Russ. 1874) see Arch. Zool. Exp., ser. 2, vol. 1, pp. 55-76, 1883.—SHIPLEY, Mitth. Zool. Station zu Neapel., vol. 4, p. 494, 1883.

Argiope forbesii DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 373, 1852.

Cistella neapolitana DALL, Amer. Journ. Conch., vol. 6, p. 146, 1871; Proc. Acad. Nat. Sci. Phila. for 1873, p. 194.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 131, pl. 22, figs. 8-24, 1886.

Argiope biplicata SEGUENZA, Rend. Accad. Sci. Napoli, vol. 15, pp. 123-4, 1876.

Argiope kowalevskii SCHULGIN, Zeits. f. Wiss. Zool., vol. 41, p. 122, pl. 41, figs. 7-9, 12; pl. 42, figs. 14-31, 1884.

Type locality.—Mediterranean near Nice, coralline zone; Risso.

Cat. No.	Locality.	Collector.	Number of specimens.
173450	Gulf of Naples.....	Stefanis.....	1
173447	Gulf of Naples.....	Costa.....	1
173459	Gulf of Naples.....	Issel.....	5
11886	Mediterranean.....	Damon.....	2
173451	Mediterranean, 40 fathoms.....	Capt. Nares.....	14
173442	Sicily.....	Stefanis.....	10
202475	Sicily.....	Stefanis.....	5
173446	Sardinia.....	Verany.....	1
173444	Tunis coast.....	Shearwater Exp.....	2
173445	Tunis coast.....	Capt. Nares.....	1
173443	Tunis coast.....	Carpenter.....	1
173453	Malta.....	Gibson.....	2
173452	Pantellaria Ids.....	Capt. Nares.....	28
173454	Dalmatia.....	Brusina.....	1
173456	Spezzia.....	J. Doria.....	1
173457	Aegean Sea.....	Spratt.....	1
173458	Aegean Sea.....	Capt. Nares.....	1
14746	Canary Ids.....	McAndrew.....	1

ARGYROTHECA CORDATA, new variety EXOPLEURA.

Brown, ribless, bilobed, with prominent beak.

Cat. No.	Locality.	Collector.	Number of specimens.
173448	Gulf of Naples.....	Tiberi.....	4
173449	Gulf of Naples.....	Acton.....	4
173452a	Pantellaria Islands.....	Capt. Nares.....	4
173454a	Dalmatia.....	Brusina.....	1
173455	Zara.....	Jeffreys.....	1

The variety forms quite a contrast with the ribbed, wider, and less triangular *cordata*, and may on more thorough investigation prove distinct. The specimens when full grown are uniformly larger than the typical form.

ARGYROTHECA BARRETTIANA Davidson.

Argiope barrettiana DAVIDSON, Proc. Zool. Soc., Feb. 1866, p. 103, pl. 12, fig. 3.

Argiope antillarum CROSSE and FISCHER, Journ. de Conchyl., vol. 14, p. 270, pl. 8, fig. 7, July, 1866.

Type locality.—Northeast coast of Jamaica, West Indies, in 150 fathoms. Lucas Barrett.

Cat. No.	Locality.	Collector.	Number of specimens.
87532	Off Cape Florida, 193 fathoms.....	B. F.	1
93405	Off Cape Florida, 85 fathoms.....	B. F.	1
64229	Gulf of Mexico, 101 fathoms.....	Blake	5
64228	Off Havana, 805 fathoms.....	Blake	1
64247	Tongue of Ocean.....	B. F.	1
314863	Barbados.....	Henderson.....	3½

This is a much larger species than *A. schrammi* though the coloration is similar.

ARGYROTHECA LUTEA Dall.

Cistella lutea DALL, Bull. Mus. Comp. Zool., vol. 3, p. 20, pl. 1, figs. 5, 5a.; pl. 2, figs. 4-8, 1871; vol. 12, p. 203, 1886.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 142, pl. 23, figs. 5, 6, 1887.

Type locality.—Tortugas, 30-43 fathoms. Pourtales.

Cat. No.	Locality.	Collector.	Number of specimens.
92495	Off Cape Hatteras, 49 fathoms.....	B. F.	1
32924	Tortugas Pass, 43 fathoms.....	Pourtales.....	2
110963	Tortugas Pass, 30 fathoms.....	Pourtales.....	3
64245	Off Havana, 80-127 fathoms.....	Sigsbee.....	3
314884	Barbados, 30-70 fathoms.....	Henderson.....	6
314878	Barbados, 35-75 fathoms.....	Henderson.....	3
64246	Barbados, 100 fathoms.....	Blake.....	2
314879	Barbados, 90-100 fathoms.....	Henderson.....	4
314880	Barbados, 33 fathoms.....	Henderson.....	4
314881	Barbados, 50-60 fathoms.....	Henderson.....	2
314882	Barbados, 65-70 fathoms.....	Henderson.....	1
314883	Barbados.....	Henderson.....	2
62342	Off Rio Janeiro, 70 fathoms.....	Norseman.....	1

ARGYROTHECA SCHRAMMI Crosse and Fischer.

Argiope schrammi CROSSE and FISCHER, Journ. de Conchyl., vol. 14, p. 269, pl. 8, fig. 6, July, 1866.

Cistella (? *schrammi* var.) *rubrotincta* DALL, Bull. Mus. Comp. Zool., vol. 3, p. 19, pl. 1, figs. 6, 6a., 1871.

Cistella barrettiana var. *rubrotincta* DALL, Bull. Mus. Comp. Zool., vol. 12, p. 203, 1886.

Type locality.—Island of Guadeloupe, West Indies, in 100 to 125 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
82923	Florida Keys.....	Pourtales.....	2
110962	Tortugas, 43 fathoms.....	Pourtales.....	5
64231	Barbados, 100 fathoms.....	Blake.....	6
314876	Barbados, 50-60 fathoms.....	Henderson.....	Many.
314877	Barbados, 33 fathoms.....	Henderson.....	Many.
314864	Barbados, 100 fathoms.....	Henderson.....	1
314865	Barbados, 75-80 fathoms.....	Henderson.....	18
314866	Barbados, 30-70 fathoms.....	Henderson.....	Many.
314868	Barbados, 80 fathoms.....	Henderson.....	12
314869	Barbados, 75 fathoms.....	Henderson.....	27
314890	Barbados, 75-80 fathoms.....	Henderson.....	4
314875	Barbados, 80 fathoms.....	Henderson.....	33
314872	Barbados, 40-75 fathoms.....	Henderson.....	24
314873	Barbados, 35-75 fathoms.....	Henderson.....	26
314871	Barbados, 35.....	Henderson.....	1
314874	Barbados, 25-72 fathoms.....	Henderson.....	18
314867	Antigua, 120 fathoms.....	Henderson.....	4
64230	Grenada, 170.....	Blake.....	1

Some confusion was caused by the fact that the coloration of Davidson's *A. barrettiana* and of this species is similar, while Crosse and Fischer figured one of the rare unicolorate specimens to illustrate their *A. schrammi*. But the reception of many specimens has enabled me to clear this up, the former species being many times larger than the latter which is extremely uniform. If the difference in color be regarded as of varietal rank, the name *rubrotincta* would apply to the specimens with scarlet radial lines.

Genus MEGATHYRIS Orbigny.

Megathiris ORBIGNY, Comptes Rendus, vol. 25, pp. 192, 269, 1847; Ann. Sci. Nat., Zool., ser. 3, vol. 8, p. 341, 1847.

Megathyrus BRONN, Jahrbuch für Mineral., p. 244, 1848.

Argiope DESLONGCHAMPS, Mém. Soc. Lin. de Normandie, vol. 7, p. 9, 1842; not *Argiope* Savigny, 1827.

MEGATHYRIS DETRUNCATA Gmelin.

Anomia decollata CHEMNITZ, Conch. Cab., vol. 8, p. 96, pl. 98, fig. 705 a-d., 1785 (not binomial).

Anomia detruncata GMELIN, Syst. Nat., p. 3347, 1791.

Anomia decollata DILLWYN, Descr. Cat. Rec. Sh., vol. 1, p. 292, 1817.

Terebratula detruncata BLAINVILLE, Dict. Sci. Nat., vol. 53, p. 141, 1828.—PHIL-IPPI, En. Moll. Sicil., vol. 1, p. 96, pl. 6, fig. 14, 1836.—FORBES, Aegean Sea, p. 141, 1844.

Terebratula aperta BLAINVILLE, Dict. Sci. Nat., vol. 53, p. 144, 1828.

Terebratula urna-antiqua RISSO, Hist. Nat. Eur. MÉR., vol. 4, p. 388, pl. 12, fig. 177, 1826.

Terebratula cardita RISSO, Hist. Nat. Eur. Mer., vol. 4, p. 389, pl. 12, fig. 180, 1826.

Terebratula decollata DESHAYES in Lamarck, Anim. s. Vert., ed. 2, vol. 7, p. 350, 1836.

Terebratula dimidiata SCACCHI, Osserv. Zool., p. 17, 1833.

Argiope decollata DESLONGCHAMPS, Mém. Soc. Lin. de Normandie, vol. 7, p. 9, 1842.

Orthis detruncata PHILIPPI, En. Moll. Sicil., vol. 2, p. 69, 1844.

Megathiris detruncata ORBIGNY, Ann. des Sci. Nat., sér. 3, vol. 8, p. 341, 1847.

Terebratula pectiniformis O. G. COSTA, Mém. Accad. Real. Sci. di Napoli, vol. 5, p. 39, pl. 1, fig. 6, 1852.

Megathyrus decollata DALL, Amer. Journ. Conch., vol. 6, p. 145, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 193.

Argiope decollata JEFFREYS, Proc. Zool. Soc. 1878, p. 409.—DAVIDSON, *Challenger* Brach., p. 57, pl. 4, figs. 12, 13, 1880; Mon. Rec. Brach., pt. 2, p. 128, pl. 21, figs. 30-35, 1886.

Type locality.—Mediterranean Sea.

Cat. No.	Locality.	Collector.	Number of specimens.
11889	Mediterranean.....	Damon.....	5
21930	Mediterranean.....	Crosse.....	1
173425	Figd. Brit. Conch. V, pl. XIX, fig. 3.....	Jeffreys.....	3
173426	Cape Breton, France.....	Jeffreys.....	1
198844	Corsica.....	Lea Coll.....	1
173427	Corsica.....	Susini.....	2
173433	Naples.....	Dohrn.....	1
173434	Naples.....	Tiberi.....	1
174939	Algerine coast, 51 fathoms.....	<i>Porcupine</i> Exp.....	6 v.
174938	Off Morocco, 128 fathoms.....	<i>Porcupine</i> Exp.....	8
173429	Skerke Bank, 30-120 fathoms.....	<i>Porcupine</i> Exp.....	2
174941	Adventure Bank, 92 fathoms.....	<i>Porcupine</i> Exp.....	6 v.
174940	Benzert Roads.....	<i>Porcupine</i> Exp.....	6
173430	Tunis coast, 40-120 fathoms.....	<i>Porcupine</i> Exp.....	3
173431	Tunis coast, 80-120 fathoms.....	Capt. Nares.....	20
173432	Aegean Sea, 40 fathoms.....	Capt. Nares.....	30
173438	Aegean Sea, 130 fathoms.....	Spratt.....	10
173435	Adriatic Sea.....	Stossich.....	1
173436	Adriatic Sea.....	Parreys.....	1
173437	Adriatic Sea.....	Brusina.....	2
173439	Off Crete, 70-120 fathoms.....	Spratt.....	1
173440	Mediterranean.....	Issel.....	1
173441	Mediterranean, 30 fathoms.....	Capt. Nares.....	11
130332	Off Isles deserts, Africa, 54 fathoms.....	<i>Travailleur</i>	2
199368	Off "Guadeloupe" (?).....	Ancey.....	3

The first binomial valid name given to this species is that of Gmelin. The name *ungula*, applied by Retzius to an unidentifiable figure in Gualtieri, is earlier, but the figure is not only unidentifiable but bears not the slightest resemblance to the present species.

The specimen received from Ancey was labeled by him *Argiope cordata* and said to have been collected by Marshall. That it really came from Guadeloupe may well be questioned. The specimens are identical with the Mediterranean form. The usual variations in the number of ribs, convexity and lateral extension, run through the series above enumerated.

Family TEREBRATELLIDAE.

Subfamily DALLININAE.

Genus PLATIDIA O. G. Costa.

Platidia O. G. COSTA, Fauna del Regno Napoli, p. 47, Jan. 1852.

Morrisia DAVIDSON, Ann. Mag. Nat. Hist., May, 1852, p. 371.

Platydia DAVIDSON, Mon. Rec. Brach., vol. 2, p. 152, 1887.

PLATIDIA SEMINULA Philippi.

Terebratula seminulum PHILIPPI, En. Moll. Sicil., vol. 1, p. 97, pl. 6, figs. 15 a-g, 1836.

Orthis anomiooides SCACCHI and PHILIPPI, En. Moll. Sicil., vol. 2, p. 69, pl. 18, figs. 9 a-g, 1844.

Terebratula appressa FORBES, Rep. Moll. Aegean Sea, pp. 141, 167, 193, 1844.

Platidia anomiooides O. G. COSTA, Fauna del Regno Napoli, p. 48, pl. 3, fig. 4; pl. 3bis, fig. 6, 1852.

Morrisia seminulum DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 371, 1852.

Morrisia anomiooides DAVIDSON, Proc. Zool. Soc., 1852, pl. 14, fig. 29.

Platidia (Morrisia) anomiooides DAVIDSON, Geol. Mag., vol. 7, p. 405, pl. 21, figs. 15, 15a, 1870.

Platidia anomiooides DALL, Amer. Journ. Conch., vol. 6, p. 14, figs. 20, 21, 1870.—DAVIDSON, Challenger Brach., p. 55, pl. 4, figs. 10, 11, 1880.—ZITTEL, Handb. d. Pal., vol. 2, p. 708, 1880.—DESLONGCHAMPS, Etudes Crit. Brach., p. 160, pl. 13, fig. 19, 1884.

Platidia seminulum MONTEROSATO, Journ. de Conchyl., vol. 27, p. 307, pl. 13, fig. 3, 1879.

Platydia anomiooides DAVIDSON, Mon. Rec. Brach., pt. 2, p. 152, pl. 21, figs. 15-19, 1887.

Type locality.—Sicily.

Cat. No.	Locality.	Collector.	Number of specimens.
173446	Sicily.....	Monterosato.....	1
173464	Sicily.....	Seguenza.....	2
173460	Cape Breton, France.....	De Folin.....	1
173461	Gulf of Gascony.....	De Folin.....	1
173462	Portugal coast.....	Kent.....	4
60932	Portugal coast 500 fathoms.....	Dall.....	1
110964	Mediterranean.....	Dall.....	1
173467	Naples.....	Tiberi.....	1
173468	Naples.....	Tiberi.....	3
173463	Off Tunis.....	Porcupine Exp.....	3
173465	Adventure Bank.....	Shearwater Exp.....	20
87346	Fernandina, Florida, 294 fathoms.....	Blake.....	1 v
110965	Tortugas, Florida, 237 fathoms.....	Pourtales.....	1
64234	Off Havana, 292 fathoms.....	Blake.....	1
87251	Off Havana, 119 fathoms.....	Blake.....	1
64233	Off Grenada, 291 fathoms.....	Blake.....	1

PLATIDIA SEMINULA RADIATA Dall.

210058	Off Point Pinos, California, 50 fathoms.....	B. F.....	1
107727	San Pedro Bay, California, 200 fathoms.....	Oldroyd.....	25
60930	Types, San Diego, California.....	Orcutt.....	2
60931	Todos Santos Bay.....	Orcutt.....	1
64232	Off Santa Cruz Island, West Indies, 218 fathoms.....	Blake.....	1

The variety was described in the Proceedings of the U. S. National Museum¹ from beach drift collected by C. R. Orcutt at San Diego, California. It differs from the normal type by having fine radiating lines on the upper valve.

PLATIDIA JAPONICA, new species.

Shell resembling *P. seminula* but much larger, the valves when normally developed relatively wider, the foramen entirely confined to the attached valve, the free valve having the apex entire and a very narrow long flattish area on each side; the soft parts, so far as could be determined from a dry specimen softened in weak liquor potassae, do not differ in arrangement from the Mediterranean species. Height 5.3, width 7.5, diameter 1.3 mm.

Type locality.—Off Hondo, Japan, in 65 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
110966	Off Hondo, Japan, 65 fathoms.....	B. F.	15
110956	Yokohama, Japan.....	F. Stearns.....	1

The Yokohama specimen was adhering to the shell of *Terebratulina crossei* Davidson.

Type.—Cat. No. 110966, U.S.N.M.

Subfamily MUHLFELDTIINAE.

Genus MÜHLFELDTIA Bayle.

Megerlia KING, Permian Foss., pp. 81, 145, 1850.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 103, 1887 (section "A" only).

Megerlea DAVIDSON, Introd. Brach., p. 129, 1856.

Megerlia DALL, Amer. Journ. Conch., vol. 6, p. 129, 1871; not of Robineau Desvoidy, 1830.

Mühlfeldtia BAYLE, Journ. de Conchyl., vol. 28, 1880, p. 240.

Type.—*Anomia truncata* Linnaeus.

MÜHLFELDTIA DISCULUS Pallas.

Anomia disculus PALLAS, Misc. Zool., p. 184, pl. 14, fig. 1 a-g, 1766.

Anomia truncata LINNAEUS, Syst. Nat., ed. 12, p. 1152, 1767.—BORN, Mus. Vindob., p. 118, pl. 6, fig. 14, 1778.

Terebratula truncata RETZIUS, Diss. Nov. Gen. Test., p. 14, 1788.

Delthyris truncata ANTON, Verz. Conch., p. 22, 1839.

Orthis oblita MICHELOTTI, Foss. Mioc. Ital., pl. 1, fig. 21, 1847.

Megerlia truncata KING, Permian Foss., p. 140, 1850.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 369, 1852; Mon. Rec. Brach., pt. 2, p. 103, pl. 19, figs. 11-20, 1887.

Mühlfeldtia truncata FISCHER and OEHLERT, Expl. Travailleur et du Talisman, p. 80, 1891.

Type locality.—Mediterranean.

¹ Vol. 8, p. 551, Sept. 30, 1885.

Cat. No.	Locality.	Collector.	Number of specimens.
11885	Mediterranean.....	Damon.....	2
14560	Mediterranean.....	Damon.....	2
110954	Mediterranean.....	Dall.....	10
21965	Mediterranean.....	Cuming.....	1
131052	Mediterranean.....	Chamberlain.....	2
174935	Mediterranean.....	Jeffreys.....	Many.
173790	Torbay, England.....	Turton.....	1
173791	Cape Breton, France.....	De Folin.....	1
173792	Cape Breton, France.....	De Folin.....	1 yo.
174936	West of Portugal.....	Porcupine Exp.....	1
173838	Gulf of Naples.....	Dohrn.....	17
173831	Gulf of Naples.....	Issel.....	4
173825	Gulf of Naples.....	Stefanis.....	1
173826	Gulf of Naples.....	Tiberi.....	1
173827	Gulf of Naples.....	Tiberi.....	4
173818	Corsica.....	Susini.....	1
173819	Corsica.....	Susini.....	15
173820	Ajaccio.....	Susini.....	1
173821	Ajaccio.....	Susini.....	1 yo.
173822	Sicily.....	Sowerby.....	1
173823	Pantellaria Islands.....	Capt. Nares.....	2
173800	Pantellaria Islands.....	Shearwater Exp.....	1
173837	Adventure Bank.....	Capt. Nares.....	1
173801	Adventure Bank.....	Shearwater Exp.....	3
173817	Adventure Bank.....	Shearwater Exp.....	6
173796	Skerke Bank.....	Shearwater Exp.....	3
173794	Skerke Bank.....	Shearwater Exp.....	20
173795	Benzert Roads, Tunis.....	Carpenter.....	10
173797	Benzert Roads, Tunis.....	Shearwater Exp.....	2
174937	Off Morocco coast.....	Porcupine Exp.....	1
173798	West of Soloom Bay.....	Shearwater Exp.....	3
173799	Tunis coast.....	Capt. Nares.....	1
173828	Aegean Sea.....	Spratt.....	1
173829	Aegean Sea.....	Spratt.....	20
173830	Aegean Sea.....	Capt. Nares.....	1
11781	New South Wales (?).....	Angas.....	1

MÜHLFELDTIA DISCULUS GRANOSA Seguenza.¹

173795	Benzert Roads, Tunis.....	Shearwater Exp.....	10
173796	Skerke Bank, Tunis.....	Shearwater Exp.....	1
173798	West of Soloom Bay, Tunis.....	Shearwater Exp.....	1
173799	Coast of Tunis.....	Capt. Nares.....	1
173800	Off Pantellaria Islands.....	Shearwater Exp.....	1
173801	Adventure Bank.....	Shearwater Exp.....	2
173817	Adventure Bank.....	Shearwater Exp.....	3
173822	Sicily.....	Sowerby.....	1

¹ *Megerlia granosa* Seguenza, Pal. Mal. Terz. Messina, p. 65, 1865; and Form. Terz. Calabria, p. 190, 1880.

The more northern specimens of this species show usually radial threads, rarely somewhat imbricated, but a large proportion of those from the south shore of the Mediterranean are more or less distinctly granulose, the granules, especially those situated laterally near the beak, sometimes are produced into short prickles, easily worn off.

Genus PANTELLARIA Dall.

Pantellaria DALL, Proc. Biol. Soc. Wash., vol. 32, p. 251, 1919.

The genus *Mühlfeldtia* is characterized among other things by the peduncular foramen being normally confined to the beaked valve as in most Terebratulidae, the extension of the foramen to the brachial valve being due to wear and to that extent abnormal; both valves are free and similarly sculptured. In the present genus the foramen normally is confined to the brachial valve, only by wear encroaching on the other; the brachial valve is applied to the substratum, reproducing its irregularities and except for those is smooth, while the upper valve has radial sculpture.

Type.—*Mühlfeldtia monstrosa* Scacchi.

PANTELLARIA MONSTROSA Scacchi.

Terebratula monstrosa SCACCHI, Osserv. Zool., No. 2, p. 17, 1838; Cat. Conch.

Regn. Napoli, p. 8, 1836 (name only).—O. G. COSTA, Fauna del Regn. di Napoli, p. 43, pl. 9, figs. 4, 5, 1851.

Megerlia truncata var. *monstrosa* MONTEROSATO, Poche note s. Conch. Medit. p. 4, 1875.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 108, pl. 19, figs. 21, 22a, 1887.

Mühlfeldtia monstrosa FISCHER and OEHLERT, Exp. Sci. du Travailleur et du Talisman, p. 87, pl. 7, figs. 12 a-c, 1891.

Type locality.—Naples, Italy.

Cat. No.	Locality.	Collector.	Number of specimens.
173791	Cape Breton, France.....	De Folin.....	1
173793	Bay of Biscay.....	De Folin.....	5
173835	Mediterranean.....	Jeffreys.....	1
173818	Corsica.....	Susini.....	1
173820	Ajaccio, Corsica.....	Susini.....	1
173822	Sicily.....	Sowerby.....	1
173833	Palermo.....	Monterosato.....	1
173836	Naples.....	Tiberi.....	1
110955	Gulf of Naples.....	Dall.....	2
173825	Gulf of Naples.....	Tiberi.....	1
173825a	Gulf of Naples.....	Stefanis.....	1 yo.
173828	Ægean Sea.....	Spratt.....	3 v.
173832	Adriatic Sea.....	Issel.....	1

This species, with the loop of *Mühlfeldtia*, has a foramen and lower valve like that of *Platidia*. Most of the figures indicate the foramen as encroaching on the upper valve, but this is abnormal. An examination of a perfectly unworn specimen will show conclusively that the foramen is normally entirely confined to the brachial valve.

PANTELLARIA ECHINATA Fischer and Oehlert.

Mühlfeldtia echinata FISCHER and OEHLERT, Journ. de Conchyl., vol. 38, p. 73, 1890; Exp. Sci. du Travailleur et du Talisman, p. 90, pl. 7, figs. 13a-g, text fig. 8, 1891.

? *Morrisia gigantea* DESHAYES, Cat. Moll. Isle Réunion, p. 37, pl. 5, figs. 9, 10, 11, 1863.

Type locality.—Off Cape Bojador, Sudan coast of West Africa, in 640 to 782 meters.

Cat. No.	Locality.	Collector.	Number of specimens.
130333	Off Cape Bojador, 407 fathoms.....	<i>Talisman</i> Exp.....	4
173834	Cape of Good Hope, 224 fathoms.....	Jeffreys.....	1
11781	New South Wales.....	Angas.....	1
64436	Barbados, 100 fathoms.....	Blake.....	1
274171	Sand Key, Florida.....	Henderson.....	1

Deshayes species has much the aspect of *P. echinata* with the spines worn off, and in view of the wide distribution of the latter, if not a distinct species, is more likely to belong to the *echinata* than to the closely allied *monstruosa*, which appears to be confined to the west coast of France and Spain and the Mediterranean. Not having seen a specimen of Deshayes' shell, only a tentative opinion can be expressed as to its relations.

Genus FRENULINA Dall.

Megerlia DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 369, 1852.

Ismenia A. ADAMS, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 99, 1863.—DALL, Amer. Journ. Conch., vol. 6, p. 127, 1870; Proc. Acad. Sci. Nat. Phila. for 1873, p. 187; Bull. U. S. Nat. Mus., No. 8, p. 39, 1877.

Megerlia (sect. B) DAVIDSON, Mon. Rec. Brach., pt. 2, p. 108, 1887.

Frenulina DALL, Proc. U. S. Nat. Mus., vol. 17, p. 724, 1894.

Type.—*Anomia sanguinolenta* Gmelin.

FRENULINA SANGUINOLENTA Gmelin.

Anomia sanguinea CHEMNITZ, Conch. Cab., vol. 8, p. 96, pl. 78, fig. 706, 1785 (not binomial).

Anomia sanguinolenta GMELIN, Syst. Nat., p. 3347, 1792.—DILLWYN, Descr. Cat. Rec. Shells, vol. 1, p. 293, 1817.

Terebratula cruenta (Solander MS.) DONOVAN, Nat. Repository, vol. 2, pl. 56, fig. 1, 1824.

Terebratula sanguinolenta BLAINVILLE, Dict. Sci. Nat., vol. 53, p. 142, 1828.

Terebratula erythroleuca QUOY and GAIMARD, Voy. *Astrolabe*, vol. 3, p. 557, pl. 85, figs. 8, 9, 1834.

Terebratula pulchella SOWERBY, Thes. Conch. *Terebratula*, pl. 71, figs. 105–107, 1847.

Ismenia reevei A. ADAMS, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 99, 1863.—DAVIDSON, Proc. Zool. Soc., 1871, p. 308, pl. 31, fig. 3.

Frenula sanguinea ZITTEL, Handb. d. Palaeont., p. 708, 1880.

Megerlia sanguinea DAVIDSON, Mon. Rec. Brach., pt. 2, p. 108, pl. 20, figs. 1–8; var. *reevei*, figs. 12, 12 b, 1887.

Type locality.—"East Indies." Mindanao, Philippines.

Cat. No.	Locality.	Collector.	Number of specimens.
17820	Hawaiian Islands.....	Pease.....	5
77273	Hawaiian Islands.....	Pease.....	4
41700	Hawaiian Islands.....	Dall.....	1
110953	Hawaiian Islands.....	Dall.....	4
107024	Hawaiian Islands, 298 fathoms.....	B. F.....	1
274172	Molokai, 24 fathoms.....	B. F.....	1
274173	French Frigate Shoal, 17 fathoms.....	B. F.....	1
237239	Mindanao, Philippine Islands, 28 fathoms.....	B. F.....	1 v.
295330	Mindanao, Philippine Islands, 100 fathoms.....	B. F.....	1 v.
237268	Mindanao, Philippine Islands, 48 fathoms.....	B. F.....	1
237173	Mindanao, Philippine Islands, 20 fathoms.....	B. F.....	3
237303	Mindanao, Philippine Islands, 21 fathoms.....	B. F.....	1
294569	Off Jolo, Philippine Islands, 22 fathoms.....	B. F.....	10
235462	Off Jolo, Philippine Islands, 22 fathoms.....	B. F.....	1
293985	Off Jolo, Philippine Islands, 21 fathoms.....	B. F.....	7
294106	Off Jolo, Philippine Islands, 29 fathoms.....	B. F.....	5 v.
229424	Off Jolo, Philippine Islands, 318 fathoms.....	B. F.....	1 v.
294222	Off Jolo, Philippine Islands, 19 fathoms.....	B. F.....	2
239692	Off Jolo, Philippine Islands.....	B. F.....	1
239524	Off Jolo, Philippine Islands.....	B. F.....	1
230386	Off Jolo, Philippine Islands, 20 fathoms.....	B. F.....	1
246325	Off North Burias Islands, 105 fathoms.....	B. F.....	1 v.
229554	Off Mindoro Islands, 162 fathoms.....	B. F.....	3 fr.
229587	Off Mindoro Islands, 162 fathoms.....	B. F.....	1 v.
235916	Sulu Archipelago, 17 fathoms.....	B. F.....	3
236281	Off Tawitawi Islands, 10 fathoms.....	B. F.....	1
292546	Off Tawitawi Islands, 17 fathoms.....	B. F.....	25
292029	Off Tawitawi Islands, 24 fathoms.....	B. F.....	1
295154	Off Tawitawi Islands, 10 fathoms.....	B. F.....	2
297244	Observation Island, 46 fathoms.....	B. F.....	1
300394	Off East Cebu Island, 165 fathoms.....	B. F.....	1 v.
293469	Off East Panay Island, 126 fathoms.....	B. F.....	1
235258	Off Corregidor Island, 13 fathoms.....	B. F.....	2
237132	Pakiputan Strait, 23 fathoms.....	B. F.....	1
335493	South Pangosinan, 19 fathoms.....	B. F.....	2
236659	Off northeast Tables Island, 37 fathoms.....	B. F.....	2
300121	Off Celebes, 37 fathoms.....	B. F.....	1

The variety *reevei* differs only by being pure white according to Davidson, but his figure is sufficiently different to create a doubt. Among the large number I have handled, none has come from Japan, and none corresponds to Davidson's figure or A. Adams's description. I have not seen any Japanese specimens.

FRENULINA ALCOCKI Joubin.

Kingenia alcocki JOUBIN, Bull. Mus. d'hist. Nat. Paris, vol. 12, for 1906, p. 529, text figures 1, 2, 1907.

Type locality.—Indian Ocean, south of India, in 187 fathoms. Alcock.

Cat. No.	Locality.	Collector.	Number of specimens.
111056	Sulu Sea.....	Valdivia Exp.....	1
227823	Off south India, 187 fathoms.....	Alcock.....	1

The above mentioned specimens were sent me by Doctor Blochmann. On examination of the loop I am compelled to the conclusion that the details do not agree with the type of the genus *Kingena* as figured from the original fossil, but that there is really no essential difference between the loop of *alcocki* and *Frenulina sanguinolenta*. I have therefore referred the species to *Frenulina*.

FRENULINA MAUIENSIS, new species.

Shell large for the genus, pale brown, medially slightly compressed, moderately convex; valves sculptured only with concentric growth lines at wide intervals, and a very obvious minute and dense punctuation; pedicel valve with rather elevated and incurved beak, the foramen entire, the deltidia more or less coarsely wrinkled and seemingly not meeting but united by an irregular plug between their proximal edges; hinge teeth strong and close together with props in the younger shells which are solidly cemented to the wall of the shell in the adult; no traces of any medial ridge or septum; the anterior margins of the valves pinched together medially but not perceptibly folded; brachial valve less convex, cardinal plate solidly united over the septum, excavated in the middle, with strong dental sockets and no cardinal process, the septum thin, high and short, not extending beyond the middle of the valve distally; crura short, widely triangular; the lower limbs of the loop of almost hairlike tenuity, the reflected limb broad behind; height of shell 22; breadth 21; diameter 10 mm. U. S. Nat. Mus. Cat. No. 173035.

Type locality.—North coast of Maui Island, Hawaiian Islands, in 143 to 178 fathoms, stony bottom, temperature 60°.8 F., at Bureau of Fisheries station 4079.

Cat. No.	Locality.	Collector.	Number of specimens.
337026	North of Maui, 175 fathoms.....	B. F.	1
173035	North of Maui, 178 fathoms.....	B. F.	Type.
274175	North of Maui, 178 fathoms.....	B. F.	10
173036	North of Maui, 202 fathoms.....	B. F.	1
274174	South of Oahu, 252 fathoms.....	B. F.	1

This fine species was dredged by the U. S. Bureau of Fisheries steamer *Albatross* during the explorations among the Hawaiian Islands.

Genus TEREBRATALIA Beecher.

Terebratalia BEECHER, Trans. Conn. Acad., vol. 9, p. 377, 1873.

Terebratula SOWERBY, Proc. Zool. Soc., 1846, p. 94.

Terebratella (part) ORBIGNY, Pal. Franc. Ter. Crét., vol. 4, p. 110, 1847.

Type.—*T. transversa* Sowerby, Northwest America. Until we know the developmental stages of all our northern species, it seems best to follow Beecher in referring them all to *Terebratalia*.

TEREBRATALIA TRANSVERSA Sowerby.

Terebratula transversa SOWERBY, Proc. Zool. Soc., 1846, p. 94; Thesaurus Conch.

Terebratula, p. 361, pl. 72, figs. 114, 115, 1847; not of Gould, Otia, p. 120, 1860.

Terebratella transversa REEVE, Conch. Icon. *Terebratula*, pl. 5, fig. 22, 1860.—

DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 185.—WHITEAVES, Canadian Nat., new ser., vol. 8, p. 468, 1878.

Terebratella transversa DAVIDSON (ex parte), Mon. Rec. Brach., pt. 2, p. 79, pl. 16, figs. 6-9 (only), 1887.

Terebratalia transversa BEECHER, Trans. Conn. Acad., vol. 9, p. 377, 1893.

Magasella radiata DALL, Rep. Brach. Alaska, p. 49, 1877; Proc. Acad. Nat. Sci.

Phila. for 1877, p. 159.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 101, pl. 18, fig. 1, 1887 (immature stage). Shumagin Islands, Alaska.

Type locality.—Puget Sound, Washington.

Cat. No.	Locality.	Collector.	Number of specimens.
224275	Southeast of Alaska Peninsula, 51 fathoms	B. F.	2
222395	Southeast of Alaska Peninsula, 68 fathoms	Dall	7
110908	Southeast of Alaska Peninsula, 230 fathoms	Dall	1
110906	Coal Harbor, Shumagins, 9 fathoms	Dall	1 v.
222206	Chignik Bay, Alaska, 28 fathoms	B. F.	1
110907	Semidi Ids., Alaska, 20 fathoms	Dall	1
110905	St. Paul, Kodiak, 13 fathoms	Dall	1 v.
55822	St. Paul, Kodiak	Fisher	1
55819	Kodiak Islands	Fisher	23
87852	Kodiak Islands	Fisher	5
209767	Kodiak Islands	Fisher	23
224441	Kodiak Islands	B. F.	8
226210	Sumner Strait, 218 fathoms	B. F.	1
132966	Fort Wrangell	F. W. Ring	1 v.
73910	Vancouver Island	Hepburn	6
73575	Vancouver Island	Hepburn	1
274177	San Juan Islands	Oldroyd	4
224348a	Puget Sound, 40 fathoms	B. F.	15
225461	Puget Sound, 48 fathoms	B. F.	4
3368	Puget Sound	Kennerly	2
118583	Puget Sound	O. B. Johnson	2
224350	Puget Sound, 40 fathoms	B. F.	4
225439	Puget Sound, 37 fathoms	B. F.	6
128764	Seattle, Washington, 20 fathoms	O. B. Johnson	31
130571	Seattle, Washington, 1 w.	O. B. Johnson	9
226206	Admiralty Inlet, 25 fathoms	B. F.	2
222213	Admiralty Inlet	B. F.	7
13610	Neeah Bay, Washington	Swan	2
15598	Neeah Bay, Washington	Swan	1 v.
207221	Coast of Washington, 27 fathoms	B. F.	1
224392	Coast of Washington, 59 fathoms	B. F.	1
225330	Off Sea Lion Rock, 877 fathoms	B. F.	1
212830	Off Tillamook, 786 fathoms	B. F.	1
104118	Off Crescent City, California	Dall	1 v.
23275	Monterey Bay, California	Dall	1 v.
252994	San Pedro, California	J. J. White	1

Some of the specimens from Kodiak are of a suffused rose color.

TEREBRATALIA TRANSVERSA CAURINA Gould.

Terebratula caurina GOULD, Proc. Boston Soc. Nat. Hist., vol. 3, p. 347, 1850.

Exped. Shells, p. 468, pl. 44, fig. 582, 1857; Otia Conch., p. 97, 1862.

Terebratella caurina DALL, Amer. Journ. Conch., vol. 6, p. 119, pl. 6, figs. 1-3, 1870.

Terebratula canrena CARPENTER, Rep. Brit. Assoc., 1856, p. 278.

Terebratella transversa var. *caurina* DAVIDSON, Mon. Rec. Brach., pt. 2, p. 80, pls. 10-12, 14-14a (only), 1887.

Type locality.—Puget Sound, U. S. Exploring Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
110914	St. Paul, Kodiak Island	Dr. Miner	1
110911	Port Etches, Alaska, 8 fathoms	Dall	1
110915	Port Etches, Alaska, 18 fathoms	Dall	3 v.
110909	Port Etches, Alaska, 15 fathoms	Dall	3 v.
110912	Port Etches, Alaska, 15 fathoms	Dall	3
208598	Port Althorp, Alaska, 16 fathoms	Dall	1
11787	Sitka, Alaska, 1. w	Dall	14
110910	Sitka, Alaska, 12 fathoms	Dall	1
11785	Sitka, Alaska	Dall	2 v.
110916	Sitka, Alaska, 1. w	Bischoff	15
216399	Forrester Id., 20 fathoms	Willett	45
210422	Queen Charlotte Islands	Dawson	2
126636	Victoria, British Columbia	G. W. Taylor	11
110904	Victoria, British Columbia	Richardson	4
222219	Admiralty Inlet, 20 fathoms	B. F.	1
5904	Puget Sound	U. S. Ex. Exp.	Type.
15476	Neeah Bay, Washington	Swan	1
224342	Off Alseya River, 46 fathoms	B. F.	1
73912	Off Golden Gate, California	Stearns	1
110917	Off Point New Years, California, 16 fathoms	B. F.	1
11787	Off San Luis Obispo, California, 21 fathoms	B. F.	1
123149	Off Santa Barbara, California, 21 fathoms	B. F.	1
123150	Off Santa Barbara, California, 21 fathoms	B. F.	3
130402	Off Santa Cruz Island, California, 31 fathoms	B. F.	1
253120	Off San Pedro, California	J. J. White	9
133726	Off San Pedro, California . . . . .	. . . . .	5
128944	Off San Pedro, California	Mearns	1 v.
274178	Off San Pedro, California	Webb	2
274179	Off San Pedro, California	Simpson	3
110918	Off San Pedro, California, breakwater	Stearns	7
129323	Off San Pedro, California	Shepard	24
110919	Off San Pedro, California	Oldroyd	1
254084	Off San Pedro, California	Bryant	4
253820	Off San Pedro, California	Bryant	6
110770	Off Southern California, 26 fathoms	B. F.	1 v.
73911	Off San Diego, California	Hemphill	1
211952	Off San Diego, California, 20 fathoms	B. F.	1 yo.
110886	Off San Diego, California, kelp roots	Hemphill	2 yo.
110920	Off San Thome, Lower California	Hemphill	1 yo.

The typical *transversa* which is smooth or nearly so, grows to a much greater size than the wide strongly ribbed *caurina*, which is on the whole more southern in distribution. The former is generally of a grayish color, the latter tends to reddish.

TEREBRATALIA CAURINA RUBESCENS Dall.

Terebratalia transversa rubescens DALL, Nautilus, vol. 24, No. 8, Dec. 1910, p. 96.

Type locality.—San Pedro, California.

Cat. No.	Locality.	Collector.	Number of specimens.
110887	Monterey, Cal.....	Dall.....	1
253820a	San Pedro, Cal.....	Bryant.....	Type.

TEREBRATALIA OCCIDENTALIS Dall.

Terebratella occidentalis DALL, Proc. Cal. Acad. Sci., vol. 4, p. 182, pl. 1, fig. 7. 1871; Proc. Acad. Nat. Sci. Phila. for 1891, pp. 172-3, pl. 4, figs. 8-9, (not 6-7 as indicated in the explanation of the plates).

Terebratella transversa DAVIDSON, Mon. Rec. Brach., pt. 2, p. 79 (in synonymy), pl. 16, fig. 13 (only), 1887, not of Sowerby.

Type locality.—Off San Clemente Island, California.

Cat. No.	Locality.	Collector.	Number of specimens.
130563	San Pedro, California.....	Oldroyd.....	2 yo.
110783	Off Anacapa Island, California, 46 fathoms...	B. F.....	1
95850	Off San Clemente Island, 45 fathoms.....	B. F.....	1
123144	Cortez Bank, 47 fathoms.....	B. F.....	1 v.

This species resembles the variety *rubescens* of *T. transversa* in color, but is much more inflated, sometimes white, with red color only on the ribs, but may be instantly distinguished from any of the forms of *transversa* by the fact that its mesial fold is directly opposite to that of any of them, the sulcus being in the pedicel valve while in *transversa* it is in the brachial valve. It was confused by Davidson with the red variety of *transversa*.

After a study of the variations in plication observed in this and other species of Terebratelloids of the North Pacific, I conclude that too high a systematic value has been placed on the various modifications, in this group at least, by some excellent students of the brachiopoda.

TEREBRATALIA OBSOLETA Dall.

Terebratella occidentalis, var *obsoleta* DALL, Proc. U. S. Nat. Mus., vol. 14, p. 186, 1891.

Terebratalia obsoleta DALL, Trans. Conn. Acad., vol. 9, p. 382, pl. 2, figs. 4-12; pl. 3, figs. 1-15, March, 1893; Proc. U. S. Nat. Mus., vol. 17, p. 726, pl. 30, fig. 7, 1895.

Dallinella obsoleta J. ALLAN THOMSON, Geol. Mag., dec. 6, vol. 2, No. 607, p. 75, Jan. 1915.

Type locality.—Northwest of Cerros Island, Lower California, in 58 fathoms, bottom temperature 50° 8 F. at United States Fish Commission station 2983.

Cat. No.	Locality.	Collector.	Number of specimens.
110972	Catalina Island, California, 50 fathoms.	Lowe.....	4
122545	Off Cerros Island, Lower California, 113 fathoms.....	B. F.....	1
123141	Off Cerros Island, Lower California, 58 fathoms.....	B. F.....	13+
123142	Northwest of Cerros Island, Lower California, 113 fathoms.....	B. F.....	7+
123143	Off Point Abreojos, Lower California, 58 fathoms.....	B. F.....	20
123140	Off Point Abreojos, Lower California, 58 fathoms.....	B. F.....	23

The plus mark stands for many young specimens of various ages in addition to the counted adults. Comparing the incongruity of the types of plication with other characters of the species concerned, it does not seem to me to have any serious systematic value in the group of recent forms here under consideration. I am not able to accept the compliment which Doctor Thomson has graciously conferred upon me in proposing on that basis a new genus for the *T. obsoleta*.

It differs from the other species of the coast in its thin and delicate polished shell which contrasts strongly with the solid dull-surfaced character of the others; its brilliant scarlet painting is equalled only by such species as *Laqueus pictus* and *Frenulina sanguinolenta*. In the completely adult there is on either side of the narrow deltidia a flattened area with a keeled edge. Beecher's diagram (pl. 3, fig. 15) of the loop is good but does not indicate the fact that the cardinal plate is divided to the apex of the valve where there is a thin wide cardinal process. A completely adult specimen measured 39 mm. high, 42 mm. wide, and has a diameter of 21 mm. It exhibits the wildest variations in plication from a barely preceptible protractive arcuation of the anterior edge of the pedicel valve to a very strong squarish ridge with four or five minor denticulations, to a ribbed form with ten or twelve subequal modifications of the margin. There is in the pedicel valve a very low slender septal median keel in the hollow of the beak which terminates in a short broad low ridge with an excavated top. There are small props to the hinge teeth from which in senile specimens an arcuate raised line runs down into the dome of the valve. In *T. transversa* the props are almost obsolete and stop short behind the teeth; in the completely adult there is a low flattish septal ridge extending beyond the middle of the pedicel valve and forked at its anterior extremity. In fairly adult *T. caurina* I find no trace of this ridge. In both there is a wide thin cardinal process and nothing resembling a cardinal plate between the dental

sockets. In both the flattened areas on the outer sides of the deltidia are wide and conspicuous.

TEREBRATALIA FRONTALIS Middendorff.

Terebratula frontalis MIDDENDORFF, Beitr. Mal. Rossica, pt. 3, p. 2, 1849; Sibirische Reise, pt. 2, p. 241, pl. 18, figs. 9-14, 1851.

Terebratella frontalis DALL, Amer. Journ. Conch., vol. 6, p. 123, 1870.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 86, pl. 15, figs. 1-8a., 1887.

Diostothyris frontalis ALLAN THOMSON, Geol. Mag., dec. 6, vol. 3, p. 504, 1916.

?*Magasella aleutica* DALL, Proc. Cal. Acad. Sci., vol. 4, p. 302, pl. 1, fig. 6, 1872 (immature stage); Proc. Acad. Nat. Sci. Phila. for 1873, p. 188.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 95, pl. 17, figs. 16-17b., 1887.

Type locality.—South coast of the Okhotsk Sea.

Cat. No.	Locality.	Collector.	Number of specimens.
210934	Bering Island, 15 fathoms.....	Grebniitsky.....	20
223494	Bering Island, 10 fathoms.....	Grebniitsky.....	2
110797	Southeast coast Sakhalin Island, 64 fathoms.....	B. F.....	1
175783	Shikotan, Chishima, Japan.....	Hirasé.....	4
273092	Shikotan, Chishima, Japan.....	Hirasé.....	4
110798	Japan Sea, 122 fathoms.....	B. F.....	1
271435	Kuril Islands.....	Sowerby.....	2
110974	Attu Island, Aleutians, 7 fathoms.....	Dall.....	2 yo.
110976	Attu Island, Aleutians, 18 fathoms.....	Dall.....	4
110980	Attu Island, Aleutians, 5 fathoms.....	Dall.....	25
110973	Nazan Bay, Atka Island, 14 fathoms.....	Dall.....	1
225481	Nazan Bay, Atka Island, 14 fathoms.....	Dall.....	5
110972	Korovin Bay, Atka Island, 14 fathoms.....	Dall.....	1
110977	Nazan Bay, Atka Island, 14 fathoms.....	Dall.....	11
110975	Nazan Bay, Atka Island, 14 fathoms.....	Dall.....	5
110979	Port Etches, Alaska, 15 fathoms.....	Dall.....	4 v.

MAGASELLA ALEUTICA.

207256	Bering Island.....	B. F.....	1
133568	Alaska.....	Dall.....	2
110939	Kyska Harbor.....	Dall.....	1
110941	Kyska Harbor, 10 fathoms.....	Dall.....	2
110943	Kyska Harbor, beach.....	Dall.....	1
110940	Kyska Small Pass, 10 fathoms.....	Dall.....	1
110942	Kyska Great Pass, 10 fathoms.....	Dall.....	4
110946	Adakh Island, beach.....	Dall.....	1
110944	Nazan Bay, Atka Island, l. w.....	Dall.....	2
110945	Nazan Bay, Atka Island, l. w.....	Dall.....	1
33801	Unalashka Island, 60 fathoms.....	Dall.....	1
224002	Unalashka Island, 60 fathoms.....	Dall.....	1
110947	Chika Islands, beach.....	Dall.....	4
110948	Coal Harbor, Unga Island, 4 fathoms.....	Dall.....	4
223227	Popoff Strait.....	Dall.....	1
110938	Popoff Strait, l. w.....	Dall.....	1 ⁶
33802	Little Koniushi Island.....	Dall.....	1
110949	Simeonoff Island.....	Dall.....	6 v.
331748	British Columbia, 238 fathoms.....	B. F.....	2

¹ Types.

Notwithstanding the fact that *Magasella aleutica* is neatly shaped and prettily colored while *Terebratalia frontalis* is dull gray, coarse and usually misshapen, I am pretty well satisfied that the former should be referred to the immature stage of the latter.

T. frontalis has an enormous pedicel opening with inconspicuous widely separated deltidia, no septal ridge in the pedicel valve, short props to the dental processes and the faintest possible indication of a protractive fold on the anterior edge of the valve; the brachial valve has a small cardinal process, there is a narrow platform with a concavely arcuate anterior edge between the crural ridges; instead of a septum a sharp groove starts from under the platform in the cavity of the beak and extends beyond the middle of the valve where a low short triangular septum, much farther forward than usual, rises out of the groove to support the loop. Davidson's figures show the crural plates entirely separated but this is not the case with my specimens. The muscular impressions are more widely separated than in the other species of the group. Upon these characters Allan Thomson has separated this species generically from *Terebratalia*.

TEREBRATALIA GOULDII Dall.

Terebratella gouldii DALL, Proc. Acad. Nat. Sci. Phila., for 1891, p. 167, pl. 4, figs. 4, 5.

?*Magasella gouldii* DALL, Proc. Zool. Soc., 1871, p. 307, pl. 31, figs. 11 *a-c*.—
DAVIDSON, Proc. Zool. Soc., 1887, p. 96, pl. 17, figs. 20-22 (immature stage).
Hakodate, W. Stimpson.

Type locality.—East coast of Japan between Yedo and Oshima.
F. Stearns.

Cat. No.	Locality.	Collector.	Number of specimens.
107712	Japan Sea on <i>Antipathes</i>	Ward.....	1
107713	Gulf of Tokio, 169 fathoms.....	B. F.....	4
208675	Gulf of Tokio, 169 fathoms.....	B. F.....	6
204662	Off Honshu Island, 259 fathoms.....	B. F.....	1
204663	Off Hondo, 259 fathoms.....	B. F.....	1

I am not so sure that the *Terebratalia* is the adult of the above-mentioned *Magasella* as I was at first, but in any case the specific name holds for the former. This species is thin with a weak hinge, a well marked "collar" within the foramen and no septal ridge; the teeth are normally propped. In the brachial valve there is a feebly developed cardinal process, the crural ridges are not united mesially, a very short low septum, almost entirely behind the muscular impressions which are very adjacent, receives the attachment of the loop some 5 millimeters in front of the beak in a specimen 28 millimeters high. In front of the septum are two short diverging raised lines about

4 millimeters long which form the inner boundaries of the muscular scars. There is an extremely faint depression medially in the pedicel valve but no other indication of folding.

TEREBRATALIA COREANICA Adams and Reeve.

- Terebratula coreanica* ADAMS and REEVE, Voy. *Samarang*, Moll., p. 71, pl. 21, fig. 3, 1850.—REEVE, Conch. Icon. *Terebratula*, pl. 7, fig. 28 a-b, 1861.
Terebratella coreanica DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 367, 1852.—SCHRENCK, Anurl. Moll., p. 468, pl. 18, fig. 7, 1867.
Terebratella miniata GOULD, Proc. Boston, Soc. Nat. Hist., vol. 7, p. 323, 1861; Otia Conch., p. 120, 1862.
Terebratella coreanica DAVIDSON, Proc. Zool. Soc., 1871, p. 304, pl. 31, figs. 4-5; Mon. Rec. Brach., pt. 2, p. 81, pl. 13, figs. 3-7, 1887.
? *Terebratella bouchardi* DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 367, 1852; Proc. Zool. Soc., 1852, p. 77, pl. 14, figs. 4-6; Mon. Rec. Brach., pt. 1, pl. 13, figs. 8-9, 1886.

Type locality.—Korean Archipelago.

Cat. No.	Locality.	Collector.	Number of specimens.
274180	Hakodate, Japan.....	Morse.....	20
274181	Hakodate, Japan.....	Morse.....	20 yo.
107730	Hakodate Bay, 12 fathoms.....	B. F.....	1
110970	Hakodate Bay, 15 fathoms.....	B. F.....	1
110976	Hakodate Bay, 44 fathoms.....	B. F.....	2
110971	Kamihama Tanfo.....	B. F.....	1
204671	Off Hondo, 88 fathoms.....	B. F.....	1 var. b.
110795	Off Ando Zaki, 80 fathoms.....	B. F.....	1
110785	Japan Sea, 47 fathoms.....	B. F.....	1
204670	Off Korea, 150 fathoms.....	B. F.....	1 var. b.
111084	Gulf of Tartary.....	Morse.....	1
183384	Tsingtao, China.....	Hammerstein...	1 v.

This beautiful species grows to be nearly the largest of recent brachiopods and in form one of the most regular. In color it varies from a suffused rose color, to the variety *miniata* Gould, which is yellowish, painted with radial streaks of red. The oval form which Davidson described as *T. bouchardi* (var. *b.*) occurs rarely among the specimens I have seen. The shell figured in the atlas to the voyage of La Perouse by Lamanon, and which was called *lamanoni* by Schrenck in 1867, is not perhaps identifiable with anything, certainly not with the present species whose arched back could hardly have been ignored by the draughtsman, as it is characteristic of even the youngest specimens, and is responsible for the deep median sulcus of the pedicel valve. The foramen is large and the rugose deltidia not coalescent, sometimes meeting, and sometimes the gap between them is filled by an irregular calcareous plug. The teeth are strong, the props reduced to a pinpoint dimple in a mass of callus in the adults. There is a low ridge bifurcate anteriorly between the mus-

cular scars but not extending into the beak, nor attaining the proportions of a septum. The interior of the valve is marked by numerous radiating, bifurcating shallow furrows. The brachial valve is medially provided with a broad depression and produced to occupy the sulcus in the opposite valve; there is a strong bifurcate cardinal process; the sockets are not cross-striated; there is a thick mass of callus bridging the gap between the stems of the crura; the loop extends nearly to the anterior edge of the valve. In this valve also a thick low ridge, grooved medially, extends from the callous mass between the crura forward between the thickened muscular scars. Out of the groove rises a very low thin short septum, the junction with the cross band of the loop is little elevated and slightly behind the middle of the valve. The interior of this valve is furrowed like the other valve. The shell is solid and tends to form callosities with age. It reaches a width of 53, a height of 52, and a diameter of 32 mm.

TEREBRATALIA XANTHICA, new species.

Shell bright yellowish-brown, transverse, inflated, smooth except for feeble incremental lines, the brachial valve feebly mesially excavated, but showing hardly any undulation at the anterior edge. The deltidia are coalescent in the young, widely separated in the adult, the adult foramen large, showing no "collar;" the props to the dental plates obsolete, no septum or mesial ridge between the muscular scars, and two short vermicular genital sinuses on each side.

Brachial valve with no cardinal process, the crural stems separated to the apex, a short wide loop with a low short septum and one genital sinus on each side. A young specimen which appears to be of the same species, however, has the crural stems united by a concave platform continuous with the posterior end of the septum which divides the space beneath the platform into two cavities. Height of shell, 25; width, 33; diameter, 19 mm.

Type locality.—Japan Sea in 86 fathoms, sand, at United States Bureau of Fisheries station 4996.

Cat. No.	Locality.	Collector.	Number of specimens.
206783	Japan Sea, 86 fathoms.....	B. F.	Type. 1 2
110797	Southeast coast Sakhalin Island, 64 fathoms...	B. F.	
111081	Hakodate, Japan.....	Morse.....	

This species presented something of a puzzle, and at first I was disposed to regard it as an extreme variation of *T. coreanica*, but on careful study the differences appeared so great that I concluded to place it separately. The transverse form, the absence of the broad

plication of the pedicel valve with the prominent sulcus found in *T. coreanica*; the widely divided crura and the absence of any marked cardinal process and other features appear to justify its separation, even if we ignore the conspicuous difference in color.

The species appears to be intermediate in general between the smooth form of *T. transversa* and *T. coreanica*.

TEREBRATALIA MARIAE A. Adams.

Terebratella mariae A. ADAMS, Ann. Mag. N. Hist., ser. 3, vol. 5. p. 412, 1860. vol 11, p. 99, 1863.—DAVIDSON, Proc. Zool. Soc., 1871, p. 305 pl. 30, figs; 15-17.—DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 1854.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 89, pl. 15, figs. 13, 14, 1887.

Type locality.—Uraga, Japan, in 21 fathoms. A. Adams.

Cat. No.	Locality.	Collector.	Number of specimens.
110793	Korea Strait, 59 fathoms.....	B. F.....	1v.

This was collected at U. S. Bureau of Fisheries station 4895, in 59 fathoms, sandy bottom.

TEREBRATALIA SPITZBERGENSIS Davidson.

Terebratella spitzbergensis DAVIDSON, Proc. Zool. Soc., 1852, p. 78; Ann. Mag. Nat. Hist., ser. 2, vol. 16, p. 442, pl. 10, fig. 3, 1855; Proc. Zool. Soc., 1871, p. 305, pl. 30, fig. 13.—JEFFREYS, Proc. Zool. Soc. 1878, p. 409, pl. 23, fig. 2.—FRIELE, Arch. f. Math. og Naturvid., p. 384, pl. 6, figs. 1, 2, 1877.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 83, pl. 16, figs. 1-5, 1887.

Cat. No.	Locality.	Collector.	Number of specimens.
173605	Figured British Conch V, pl. 8, fig. 1.....	Jeffreys.....	2
173603	Spitsbergen.....	Torell.....	1
173604	Shetland Islands.....	Jeffreys.....	1
173607	Arctic Sea.....	Belcher.....	2
173603	Greenland.....	McLain.....	2
110934	Off Hare Island, 90 fathoms.....	McLain.....	3
173608	Off Hare Island.....	Valorous Exp.....	2
173612	Off Hare Island.....	Valorous Exp.....	1
173840	Off Disco, 175 fathoms.....	Valorous Exp.....	1
173609	Off Disco.....	Jeffreys.....	2
336908	Hebron, Labrador.....	O. Bryant.....	1
110935	Gulf of St. Lawrence.....	Whiteaves.....	5
173602	Murray Bay, Quebec.....	Dawson.....	3

This interesting little species appears to be rare.

Genus LAQUEUS Dall.

Laqueus DALL, Amer. Journ. Conch., vol. 6, p. 123, 1870; Bull. U. S. Nat. Mus., No. 8, p. 41, 1877.—DAVIDSON, Mon. Rec. Brach., vol. 2, p. 111, 1887. Type *L. californicus* Carpenter, not Koch=*L. erythraeus* Dall.

LAQUEUS CALIFORNICUS Koch.

Terebratula californica KOCH, in Chemnitz, Conch. Cab., ed. 2, *Terebratula*, p. 38, pl. 2b, figs. 21-23, 1848.—SOWERBY, Thes. Conch., p. 352, pl. 70, figs. 50-51 (not 52), 1847.

Terebratula kochii KÜSTER, Chemnitz Conch. Cab., ed. 2, *Terebratula*, p. 39, pl. 2d, figs. 1-3, 1848.

Terebratula californiana DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 364, 1852.

Waldheimia californica GRAY, Brit. Mus. Cat. Brach., p. 60, 1853.

Laqueus californicus DALL (ex parte) Amer. Journ. Conch., vol. 6, p. 123, 1870.—

DAVIDSON, Mon. Rec. Brach., pt. 2, p. 112, pl. 18, figs. 6-9, 1887.

Frenula jeffreysi DALL (ex parte) Amer. Nat., vol. 5, p. 55, 1871.

Ismenia jeffreysi DALL (ex parte) Amer. Journ. Conch., vol 7, p. 65, pl. 11, figs. 7-10, 1887.

Megerlia jeffreysi DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 187.

Laqueus californicus var. *vancouveriensis* DAVIDSON, Mon. Rec. Brach., pt. 2, p. 113, pl. 18, figs. 10-13b, 1887.

Type locality.—California.

L. CALIFORNICUS, typical.

Cat. No.	Locality.	Collector.	Number of specimens.
110928a	British Columbia, 238 fathoms.....	B. F.....	1
331750	British Columbia, 238 fathoms.....	B. F.....	2
123146	Off Point Arena, California, 75 fathoms.....	B. F.....	4
225731	Off Point Pinos, California, 861 fathoms.....	B. F.....	Fr.
123145	Off Esteros Bay, California, 92 fathoms.....	B. F.....	11
226350	Off Esteros Bay, California, 92 fathoms.....	B. F.....	3
212556	Off Esteros Bay, California, 92 fathoms.....	B. F.....	10
206476	Off Central California, 92 fathoms.....	B. F.....	8
160165	Off San Pedro, California 50-75 fathoms.....	Oldroyd.....	2 vo.
209539	Off La Jolla, California 199 fathoms.....	B. F.....	Fr.
209970	Off Point Loma, California, 113 fathoms.....	B. F.....	Fr.

L. CALIFORNICUS VANCOUVERIENSIS.

224274	South East Alaska Peninsula, 51 fathoms.....	B. F.....	12
222394	South East Alaska Peninsula, 68 fathoms.....	B. F.....	5
222597	Chignik Bay, 60 fathoms.....	B. F.....	1
222217	Chignik Bay, 42 fathoms.....	B. F.....	1
123147	Shumagin Banks, 138 fathoms.....	B. F.....	5
206477	Semidi Islands., 20 fathoms.....	Dall.....	1
226355	Kodiak Island.....	Fisher.....	2
55821	Kodiak Island.....	Fisher.....	1
206475	Kodiak Island.....	Fisher.....	2
110444	Kodiak Island., 51 fathoms.....	B. F.....	4
222180	Shelikoff Strait, 56 fathoms.....	B. F.....	8
110931	Port Etches, 18 fathoms.....	Dall.....	2
110933	Port Etches, 18 fathoms.....	Dall.....	7 v.
110929	Port Etches, 15 fathoms.....	Dall.....	8 v.
110930	Port Etches, 15 fathoms.....	Dall.....	1
210043	Juneau Harbor.....	Ritter.....	2
222291	Lynn Canal, 300 fathoms.....	B. F.....	2
222201	Sumner Strait, 200 fathoms.....	B. F.....	2
222150	Kasa-an Bay, 96 fathoms.....	B. F.....	4
222197	Kasa-an Bay, 95 fathoms.....	B. F.....	4

Cat. No.	Locality.	Collector.	Number of specimens.
226229	Stephens Passage, 188 fathoms.....	B. F.....	1
226213	Stephens Passage, 200 fathoms.....	B. F.....	2
222152	Off Naha Bay, 65 fathoms.....	B. F.....	2
222129	Off Naha Bay, 175 fathoms.....	B. F.....	3
222149	Boca de Quadra, 165 fathoms.....	B. F.....	4
216400	Forrester Island., 75 fathoms.....	B. F.....	6
226427	Queen Charlotte Islands, 107 fathoms.....	B. F.....	1
222203	Queen Charlotte Islands, 140 fathoms.....	B. F.....	3
110927	Off British Columbia, 238 fathoms.....	B. F.....	15
110928	Off British Columbia, 238 fathoms.....	B. F.....	15
331750	Off British Columbia, 238 fathoms.....	B. F.....	2
110928a	Off British Columbia, 238 fathoms.....	B. F.....	1
222200	Gulf of Georgia, 190 fathoms.....	B. F.....	1
206478	Victoria, British Columbia.....	Richardson.....	1
110978	Victoria, British Columbia.....	Richardson.....	1
224484	Fuca Straits, 135 fathoms.....	B. F.....	9
224369	Fuca Straits, 100 fathoms.....	B. F.....	7
207173	Fuca Straits, 59 fathoms.....	B. F.....	1
130416	Fuca Straits, 56 fathoms.....	B. F.....	1
224424	Fuca Straits, 40 fathoms.....	B. F.....	3
224532	Fuca Straits, 114 fathoms.....	B. F.....	2
224569	Fuca Straits, 115 fathoms.....	B. F.....	2
224533	Fuca Straits, 124 fathoms.....	B. F.....	2
206724	Fuca Straits, 152 fathoms.....	B. F.....	1
223229	Fuca Straits, 151 fathoms.....	B. F.....	13
118584	Puget Sound.....	O. B. Johnson.....	1
224349	Puget Sound, 40 fathoms.....	B. F.....	5
224391	Washington coast, 59 fathoms.....	B. F.....	1
224390	Washington coast, 66 fathoms.....	B. F.....	1
225328	Washington coast.....	B. F.....	1
208639	Washington coast, 66 fathoms.....	B. F.....	1
214339	Off Tatoosh Island, 115 fathoms.....	B. F.....	2

Küster figures the typical form, which is white more or less obscured by a pale grayish periostracum, sometimes darkening to brown. I have some doubts whether the *T. kochii* of Küster, referred by Davidson to this species as a synonym, is identical. It suggests to me a discolored specimen of *T. venosa* Solander. I have never seen a specimen of the present species which agrees with Küster's figure. Sowerby figures a *Magellania* loop (fig. 32) which he, of course wrongly, refers to this species, and Reeve follows him under the name of *T. globosa* Lamarck. It is uncertain whether this is due to faulty drawing or to confusion with *T. venosa*. Carpenter identified *L. erythraeus* with this species and I followed him, but present studies have enabled me to correct this identification.

In 1871 before Friele had made clear the modification of the loop in the course of growth I confounded shells in the analogous stages of *Macandrevia cranium* and the present species under the common name of *Frenula jeffreysi*. As I referred my species in my first announcement to the North Atlantic fauna, it follows that that name must be regarded as a synonym of *M. cranium*, and for the northern

and generally smaller variety of *L. californicus* Mr. Davidson's name of *vancouveriensis* must be used.

The extreme variations in form of the variety *vancouveriensis* are very puzzling. Some of the specimens so nearly approach the *L. morsei* that it is only the presence of absolute gradations between them and the more usual ovate type that decides one to keep them distinct. Some specimens have a faint indication of uniplication in the brachial valve, others have the front edge straight but pinched together mesially as in *L. blanfordi* with a suggestion of bilobation, others again are frankly lenticular. Such differences in the same species throw doubt on the value of plication in these recent forms as a systematic character. The genital sinuses are threadlike and produced nearly to the front margin of the valves.

LAQUEUS ERYTHRAEUS, new species.

Terebratula californica CARPENTER, Suppl. Rep. Brit. Assoc., pp. 568, 574, 1864.
Not of Koch, 1848.

Waldheimia californica CARPENTER, Suppl. Rep. Brit. Assoc., p. 636, 1864.¹

Laqueus californicus DALL, Amer. Journ. Conch., vol. 6, p. 123, pl. 7, fig. f; pl. 8, figs. 9, 10, 1870.

Type locality.—Off Catalina Island, California, in 80 fathoms.
J. G. Cooper.

Cat. No.	Locality.	Collector.	Number of specimens.
19395	Catalina Island, 80 fathoms.....	Cooper.....	1
1023	Catalina Island, 120 fathoms.....	Cooper.....	Fr.
253007	Catalina Island, 50 fathoms.....	Paine.....	2
253113	Catalina Island, 50 fathoms.....	Lowe.....	3
128793	Catalina Island, 32 fathoms.....	Oldroyd.....	1
110921	Catalina Island, 50 fathoms.....	Oldroyd.....	5
149961	Catalina Island.....	Button.....	2
193755	California.....	S. F. Price.....	1

This shell is of a lovely red color, evenly suffused. It is thin and usually larger than the *L. californicus* from which it can be immediately separated by the broad heavy genital sinuses, visible through the shell, with short wide lateral branches, recalling those of *Magellania venosa*.

LAQUEUS BLANFORDI Dunker.

Terebratula blanfordi DUNKER, Index Moll. Maris Japonici, p. 251, pl. 14, figs. 4, 5, 6, 1882.

Terebratella blanfordi DAVIDSON, Mon. Rec. Brach., pt. 2, p. 83, pl. 15, figs. 9-12, 1887.

Type locality.—Near Wakayama, Japan.

¹ The *Waldheimia grayi* of Carpenter's list on this page is the red variety of *Terebratalia caurina* Gould, and his *Terebratella coreanica* is a reddish mutation of *Terebratalia transversa* Sowerby. Both *grayi* and *coreanica* are Asiatic species.

Cat. No.	Locality.	Collector.	Number of specimens.
110801	Off Avacha Bay, Kamtchatka, 682 fathoms....	B. F.....	15
110799	Japan.....	Fulton.....	2
110803	Kagoshima Gulf, 103 fathoms.....	B. F.....	1
110804	Sagami Bay, 369 fathoms.....	B. F.....	1
110802	Japan Sea, 190 fathoms.....	B. F.....	7
204661	Japan Sea, 390 fathoms.....	B. F.....	1
204664	Uraga Straits, 85 fathoms.....	B. F.....	2
204665	Suruga Gulf, 57 fathoms.....	B. F.....	1 v.
204666	Suruga Gulf, 131 fathoms.....	B. F.....	1
110847	Off Honshu Island, 265 fathoms.....	B. F.....	1
110805	Gulf of Tokio, 70 fathoms.....	B. F.....	3
107732	Gulf of Tokio, 169 fathoms.....	B. F.....	1

This species is remarkable for its variations in form. The originally described form was almost bilobate, pinched together in the median line; from this it varies to squarely truncate or even with the truncation prominent anteriorly. From rounded triangular it varies to ovate or even nearly circular, but always with the anterior truncation. Some specimens show a feeble "dorsal uniplication," others have a marked depression medially in the brachial valve, and the most normal or typical show a pinching together of both valves in the median line with more or less bilobation. In the pedicel valve the teeth are strong, with well marked props which have a callous concave area between them, with no median ridge, but two widely separated low ridges which extend two-thirds of the way to the anterior edge of the valve; in the the brachial valve there is a moderate cardinal process, the crural stems are united by a concave platform supported medially by a strong septum separating the cavity below into two parts. The septum in front of the platform is thin, moderately high and extends forward less than one-third the length of the valve, the apex where the cross band of the loop is attached is about 4 millimeters in front of the tips of the crura, in a specimen 40 millimeters long. The color is always brownish.

LAQUEUS MORSEI Dall.

Laqueus morsei DALL, Nautilus, vol. 22, No. 3, July, 1908, p. 29.

Type locality.—Japan Sea in 122 fathoms, stony mud bottom, temperature 34.1° F., at Bureau of Fisheries station 4860.

Cat. No.	Locality.	Collector.	Number of specimens.
110800	Japan Sea, 122 fathoms.....	B. F.....	3

This is of much the same type as *L. blanfordi* but larger, more inflated and with an anterior projection of the margin instead of the straight truncation visible in those varieties of *blanfordi* which have not a medial sulcus. There is an extremely faint indication of a convex undulation at the front edge of the pedicel valve.

The interior of the pedicel valve is much like that of *L. blanfordi* with three conspicuous genital sinuses on each side, rather broad and bifurcating near the margin. The brachial valve has an even shorter septum than *blanfordi*, with two straight unbranched sinuses medially and one on each side with about four lateral branches which bifurcate near the margin. There is a hardly distinguishable cardinal process. The deltidia are coalescent medially, and more or less wrinkled.

LAQUEUS RUBELLUS Sowerby.

Terebratula rubella SOWERBY, Proc. Zool. Soc., 1846, p. 94; Thes. Conch., p. 350, pl. 69, figs. 40-42, 1847.

Terebratella rubella DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 368, 1852.—GRAY, Cat. Brach. Brit. Mus., p. 90, 1853.

Laqueus rubella DAVIDSON, Proc. Zool. Soc., 1871, p. 306, pl. 30, figs. 18-22.—DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 186.

Laqueus rubellus DAVIDSON, Mon. Rec. Brach., pt. 2, p. 113, pl. 19, figs. 1-5, 1887.

Type locality.—Japan. Compare:

Anomia picta DILLWYN, Desc. Cat. Rec. Sh., vol. 1, p. 295, 1817, after Chemnitz; Conch. Cab., vol. 11, p. 247, pl. 203, figs. 2011, 2012, 1795.

Terebratula picta ANTON, Verz., p. 23, No. 891, 1839.—SOWERBY, Thes. Conch., p. 361, *Terebratula*, pl. 70, figs. 43, 44, 1847.—KÜSTER, in Chemn. Conch. Cab., ed. 2, *Terebratula*, p. 41, pl. 2 c., figs. 8, 9, 1868.

Waldheimia picta GRAY, Cat. Brach. Brit. Mus., p. 59, 1853.

Laqueus pictus DAVIDSON, Mon. Rec. Brach., pt. 2, p. 114, pl. 18, figs. 14-18, 1887.

Type locality.—Off Satanomosaki, Japan, in 55 fathoms. Arthur Adams.

Cat. No.	Locality.	Collector.	Number of specimens.
110809	Kagoshima, Japan.....	B. F.....	1
110810	Kagoshima, Japan, 58 fathoms.....	B. F.....	21
204681	Kagoshima, Japan.....	B. F.....	2 yo.
204680	Kagoshima, Japan, 70 fathoms.....	B. F.....	2
110982	Japan Sea, 47 fathoms.....	B. F.....	1
274182	Japan Sea, 45 fathoms.....	B. F.....	Many yo.
211077	Japan Sea, 44 fathoms.....	B. F.....	Many yo.
204684	Off Cape Tsiuki, 44 fathoms.....	B. F.....	1
204686	Off Cape Tsiuki, 44 fathoms.....	B. F.....	2
204682	Off Cape Tsiuki, 47 fathoms.....	B. F.....	1
204683	Off Hondo, 63 fathoms.....	B. F.....	2
110082	Off Hakodate.....	Morse.....	1
110813	Off Hakodate, 47 fathoms.....	B. F.....	10
274183	Off Hakodate.....	Morse.....	9
226188	Off Hakodate, 44 fathoms.....	B. F.....	1
193634	Off Honshu Island, 55 fathoms.....	B. F.....	2
110812	Off Honshu Island, 60 fathoms.....	B. F.....	2

Cat. No.	Locality.	Collector.	Number of specimens.
110781	Off Honshu Island, 65 fathoms.....	B. F.....	19
110737	Off Oze Zaki, 65 fathoms.....	B. F.....	1
206802	Suruga Gulf, 100 fathoms.....	B. F.....	1
124224	Jogoshima.....	F. Stearns.....	2
107728	Jogoshima.....	F. Stearns.....	1
130158	Japan.....	Herman.....	1
75107	Enosima.....	Jouy.....	2
274184	Tanaba, Kii.....	Hirasé.....	2
110811	Eastern Sea, 53 fathoms.....	B. F.....	2
110807	Eastern Sea, 139 fathoms.....	B. F.....	1
110806	Pailolo Channel, Hawaii.....	B. F.....	1

I have not seen any specimens of the typical *pictus* with the divaricating irregular coloration, but I strongly suspect that *L. rubellus* Sowerby may be identical with it. The known range is the same. Davidson states that *rubellus* is distinguished from *pictus* by "its straight or slightly indented front." He also says that the colors in the figure given by Sowerby in the *Thesaurus* are exaggerated. I have numerous specimens as bright as Sowerby's figure, and while the front edge usually shows straight, there is sufficient variation to enable one to find numerous individuals of *rubellus* with a rounded front. However, I have no typical specimens of *pictus* and therefore I refrain from uniting them, but the question is worthy of careful examination. As far as I have been able to discover, Dillwyn was the first to give validity to Chemnitz' name.

LAQUEUS SUFFUSUS Dall.

Laqueus suffusus DALL, Amer. Journ. Conch., vol. 6, p. 125, pl. 7, figs. *g, h, s*, 1870.

Laqueus pictus junior? DAVIDSON, Mon. Rec. Brach., pt. 2, p. 114, pl. 19, figs. 6, 7 *b.*, 1887.

Waldheimia cranium A. ADAMS, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 98, 1863.
Not of Müller, 1776.

Type locality.—Wharf at Yokohama, Japan. R. Pumpelly.

Cat. No.	Locality.	Collector.	Number of specimens.
11784	Yokohama, Japan.....	Pumpelly.....	22
274185	Hakodate, Japan.....	Morse.....	25
226193	Hakodate, Japan, 44 fathoms.....	B. F.....	1
110808	Korea Strait, 59 fathoms.....	B. F.....	1

When I described this species I had no specimens of *L. rubellus* for comparison, and yielded to the opinion of Mr. Davidson, that it was a pale variety of *L. rubellus*, or as he afterwards concluded of *L.*

pictus. Now that I have a large series of both for comparison, I return to my earlier opinion and believe the two to be quite distinct specifically. Adult *suffusus* is about one-third the length of adult *rubellus* and is mainly of a pale gray color, with a very faint suffusion of red about the margin. The surface is dull, while *rubellus* in fresh state is polished, and it is impossible to believe that so expert a naturalist as Arthur Adams would have confounded the brightly colored *rubellus* with *Macandrevia cranium*.

Genus MACANDREVIA King.

Macandrevia KING, Proc. Dublin Univ. Zool. Bot. Assoc., vol. 1, p. 261, 1859, not of Gray, 1860.—DALL, Bull. U. S. Nat. Mus., No. 8, p. 45, 1877; Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 444, 1908. Type, *Terebratula cranium* Müller.

MACANDREVIA CRANIUM Müller.

- Terebratula cranium* MÜLLER, Prodr. Zool. Dan., p. 249, No. 3006, 1776.—SOWERBY, Thes. Conch., *Terebratula*, p. 354, pl. 70, figs. 60–62, 1847.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 16, pl. 10, fig. 8, 1855.
- Terebratula euthyra* PHILIPPI, En. Moll. Sicil., vol. 2, p. 68, pl. 18, fig. 8, 1844 (according to Davidson).
- Terebratula glabra* LEACH, Syn. Moll. Gt. Brit., p. 359, pl. 13, figs. 3, 4, 5, 1852.
- Waldheimia cranium* GRAY, Cat. Brach. Brit. Mus., p. 58, 1853.—DALL, Amer. Journ. Conch., vol. 6, p. 110, 1870.—FRIELE, Arch. for Math. og Naturv., 1877, p. 380, pls. 1, 2, 3, figs. 1–4, 7a, 8–11.—G. O. SARS, Moll. Reg. Arct. Norv., p. 10, pl. 1, figs. 3 a–c, 1878.
- Macandrevia cranium* KING, Proc. Dublin Univ. Zool. Bot. Assoc., vol. 1, p. 261, 1859.—DALL, Bull. U. S. Nat. Mus. No. 8, p. 45, 1877.
- Waldheimia (Macandrevia) cranium* DAVIDSON, Mon. Rec. Brach., vol. 2, p. 61, pl. 12, figs. 11–23; pl. 13, figs. 1, 2, 1887.
- Frenula jeffreysi* (ex parte) DALL, Amer. Nat., vol. 5, p. 55, 1871.

Type locality.—Coast of Norway. Müller.

Cat. No.	Locality.	Collector.	Number of specimens.
75808	North Europe.....	Carpenter.....	1
110877	North Atlantic.....	Friele.....	5
110876	North Atlantic, 345 fathoms.....	Jeffreys.....	6
274186	Finmark.....	Jeffreys.....	1
109673	Finmark.....	G. O. Sars.....	2
11890	Norway.....	McAndrew.....	4
109666	Norway.....	McAndrew.....	1
110880	Norway.....	McAndrew.....	3
109667	Norway, 60 fathoms.....	McAndrew.....	1
25525	Norway.....	M. Sars.....	6
109663	Norway.....	Osbiørnsen.....	9
109662	Norway, Osterfjord.....	Jeffreys.....	1
109664	Norway.....	Friele.....	1
109665	Norway.....	Friele.....	2
109668	Norway.....	Koren.....	2
109669	Norway.....	Norman.....	3
109670	Norway.....	Jeffreys.....	3
109671	Drobak, Norway, 305 fathoms.....	Jeffreys.....	1
109672	Vallø, Norway, 50 fathoms.....	G. O. Sars.....	2

Cat. No.	Locality.	Collector.	Number of specimens.
109676	Bodö, Norway, 1 fathom.....	G. O. Sars.....	18
109800	Bodö, Norway, 50 fathoms.....	G. O. Sars.....	1
25524	Lofoten Ids., 26 fathoms.....	G. O. Sars.....	2
109674	Lofoten Ids., 54 fathoms.....	G. O. Sars.....	2
109675	Bohuslan, Sweden.....	Malm.....	1
109652	Unst, Shetlands, 170 fathoms.....	Jeffreys.....	3
109653	Unst, Shetlands.....	Jeffreys.....	20
109654	Unst, Shetlands.....	Jeffreys.....	1
109655	Unst, Shetlands.....	Jeffreys.....	3
109656	Unsthai, Shetlands.....	Jeffreys.....	3
109657	Unsthai, Shetlands.....	Jeffreys.....	11
109658	St. Magnus Bay, Shetlands.....	Jeffreys.....	1
109659	St. Magnus Bay, Shetlands, 90 fathoms.....	Jeffreys.....	1
109660	Zetland.....	Jeffreys.....	1
109661	Zetland.....	Jeffreys.....	7
109677	N. of Scotland, 632 fathoms.....	Porcupine Exp.....	6
109678	N. of Scotland, 114 fathoms.....	Porcupine Exp.....	3½
109679	N. of Scotland, 345 fathoms.....	Porcupine Exp.....	5½
109680	N. of Scotland, 203 fathoms.....	Porcupine Exp.....	Lot.
109681	N. of Scotland, 250 fathoms.....	Porcupine Exp.....	14
109682	N. of Scotland, 290 fathoms.....	Porcupine Exp.....	Lot.
109683	N. of Scotland, 190 fathoms.....	Porcupine Exp.....	3
109684	N. of Scotland, 362 fathoms.....	Porcupine Exp.....	8
109685	N. of Scotland, 155 fathoms.....	Porcupine Exp.....	5
109688	N. W. of Ireland, 164 fathoms.....	Porcupine Exp.....	3
109689	N. W. of Ireland, 420 fathoms.....	Porcupine Exp.....	2
109686	West of Ireland, 173 fathoms.....	Porcupine Exp.....	1
130328	North of Spain, 277 fathoms.....	Travailleur Exp.....	2
109687	Off Cape Finisterre, 567 fathoms.....	Porcupine Exp.....	5
109690	Off Cape Finisterre.....	Porcupine Exp.....	1
109691	Off Cape Finisterre.....	Porcupine Exp.....	2
109692	Off Cape Finisterre, 690 fathoms.....	Porcupine Exp.....	1
109693	Vigo Bay, Spain, 30 fathoms.....	Porcupine Exp.....	1
109694	Vigo Bay, Spain, 60 fathoms.....	McAndrew.....	1
109695	W. of Portugal, 292 fathoms.....	Porcupine Exp.....	4
109697	S. of Sicily, 224 fathoms.....	Porcupine Exp.....	1
109698	E. coast Greenland, 108 fathoms.....	Jeffreys.....	Frag.
110878	Developmental series.....	Friele.....	Many.
110879	Developmental series.....	Friele.....	Many.
109645-48	Developmental series.....	Friele.....	Many.
109644	Showing loop.....	Porcupine Exp.....	1
109651	Showing loop.....	Carpenter.....	1
109643	(Monstrosity).....	Jeffreys.....	1
109650	Fleming's type.....	Jeffreys.....	1
109649	Young shells.....	Jeffreys.....	1
109642	Fig'd specimens Brit. Conch., vol. 5, pl. 19,	Jeffreys.....	.....

MACANDREVIA CRANIUM, new var. NOVANGLIAE.

50668	Southeast Georges Banks, 1,149 fathoms....	B. F.....	1 v.
78069	Off Marthas Vineyard, 137 fathoms.....	B. F.....	1
78340	East of Nantucket, 1,188 fathoms.....	B. F.....	1
49068	East of Block Island, 1,178 fathoms.....	B. F.....	5

The American specimens which have been referred to *M. cranium* are all of very uniform size, much smaller than the European speci-

mens and less inflated, the anterior truncation relatively wider. Comparative dimensions, in millimeters, are as follows:

M. cranium: Height, 23; width, 18; diameter, 18.

M. novangliae: Height, 15; width, 13; diameter, 8.

Type locality.—U. S. Fish Commission station 2682 off Marthas Vineyard, in 137 fathoms, green mud, bottom temperature 47.5° F.

In other respects the variety agrees fairly well with the European form.

Another variety, *oblonga*, is noted by Jeffreys in his collection, in which the shell is elongated and narrow, though still symmetrical; but this hardly exceeds the mutation to be observed in any large collection of a species of brachiopod. The type of this variety is No. 274186, from Finmark, but there are a number of other specimens among those catalogued under the general designation of *M. cranium*.

MACANDREVIA TENERA Jeffreys.

Terebratula tenera JEFFREYS, Ann. Mag. Nat. Hist., ser. 4, vol. 18, p. 250, 1876, Proc. Zool. Soc. 1878, p. 405, pl. 22, fig. 7.

Waldheimia (Macandrevia) tenera DAVIDSON, Mon. Rec. Brach., pt. 2, p. 66, pl. 12, figs. 6-10, 1887.

Type locality.—Latitude 56° 11' N.; longitude 37° 41' W., south of Greenland in the north Atlantic, in 1,450 fathoms, Valorous Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
109799	North Atlantic, 1,450 fathoms.....	Jeffreys.....	Many v.

MACANDREVIA CRANIELLA Dall.

Macandrevia craniella DALL, Proc. U. S. Nat. Mus., vol. 17, p. 722, pl. 30, fig. 1, 1895; Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 445, 1908.

Type locality.—U. S. Bureau of Fisheries station 3362, off Cocos Island, Gulf of Panama, in 1,175 fathoms, mud, bottom temperature 36.8° F. One specimen.

It somewhat resembles *Waldheimia wyvillei* Davidson, but is larger, more solid, and wants the medial septum in the brachial valve.

MACANDREVIA AMERICANA Dall.

Eudesia fontaineana DALL, Proc. U. S. Nat. Mus., vol. 12, p. 231, 1889; not of Orbigny, 1846.

Macandrevia americana DALL, Proc. U. S. Nat. Mus., vol. 17, p. 721, pl. 32, figs. 1, 4, 7, 1895; Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 444, 1908.

Type locality.—U. S. Bureau of Fisheries station 2783, off the coast of southern Chile, in 122 fathoms, mud, bottom temperature 48° F.

Cat. No.	Locality.	Collector.	Number of specimens.
122859	Gulf of Panama, 1,672 fathoms.....	B. F.	1
110744	Off Aguja Point, Peru, 2,222 fathoms.....	B. F.	1
110794	Coast of Chile, 122 fathoms.....	B. F.	1
87547	Coast of Chile, 122 fathoms.....	B. F.	1
265902	South-southwest of San Diego, California, 1,090 fathoms.	B. F.	11
274180	Off San Diego, California, 868 fathoms.....	B. F.	2

The specimens from near San Diego are much less lenticular than the original type, more inflated, and more or less truncate in front, otherwise similar. They might perhaps be regarded as a variety *diegensis*.

MACANDREVIA DIAMANTINA Dall.

Macandrevia diamantina DALL, Proc. U. S. Nat. Mus., vol. 17, p. 723, pl. 30, fig. 5, pl. 32, figs. 3, 6, 1895; Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 445, 1908.—J. ALLAN THOMSON, Austr. Antarctic Exp., *Brachiopoda*, p. 34, 1918.—J. WILFRID JACKSON, Scot. Ant. Exp., *Brach.*, p. 379, pl. 2, figs. 15–19, 1912.

Type locality.—U. S. Bureau of Fisheries station 3362, off Cocos Island, Gulf of Panama, in 1,175 fathoms, mud, bottom temperature 36.8° F.

Cat. No.	Locality.	Collector.	Number of specimens.
122860	Off Cocos Island, 1,175 fathoms.....	B. F.	1
223627	Off Cocos Island, 1,175 fathoms.....	B. F.	2
110743	Off Sechura Point, Peru, 2,222 fathoms.....	B. F.	1
274170	Off Coats Land, 1,410 fathoms.....	Scot. Ant. Exp.....	2

The wide range of this species is notable. The props to the crural plates are less conspicuous than in the other species. They curve down toward the middle line of the cavity of the beak, where they are separated by a narrow furrow. There is a conspicuous cardinal process, which is wanting in the other species of the genus.

Genus DALLINA Beecher.

Dallina BEECHER, Trans. Conn. Acad., vol. 9, p. 382, March, 1893, type, *Terebratula septigera* Lovén.

DALLINA SEPTIGERA Lovén.

Terebratula septigera LOVÉN, Index Moll. Scand., p. 29, 1846.

Waldheimia septigera GRAY, Cat. Brach. Brit. Mus., p. 59, 1852.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 16, p. 441, pl. 10, fig. 1, 1855.—SEGUENZA, Mem. d. Soc. Ital. Sci. Nat., vol. 1, p. 44, pl. 6, figs. 1–10, 1855.—DALL, Bull. Mus. Comp. Zool., vol. 3, p. 13, pl. 1, fig. 4; pl. 2, fig. 9, 1871.—FRIELE, Arch. Math. og Naturvid., vol. 2, p. 380, pl. 3, figs. 5, 6; pl. 4, figs. 12–14, 1877.

Terebratula peloritana SEGUENZA, Notiz. Succ., p. 19, 1862.

Terebratula septata JEFFREYS, Brit. Conch., vol. 2, p. 14, 1863; not of Philippi, 1844.

Terebratula floridana JEFFREYS, Proc. Zool. Soc., 1879, p. 407; not of Pourtalès, 1868.

Waldheimia septigera DAVIDSON, Mon. Rec. Brach., pt. 1, p. 56, pl. 11, figs. 1-10, 1886.

Dallina septigera BEECHER, Trans. Conn. Acad., vol. 9, p. 382, 1893.

Type locality.—Finmark, Norway, Lovèn.

Cat. No.	Locality.	Collector.	Number of specimens.
109779	Norway.....	Lovèn.....	1
109795	Bergen, Norway.....	Friele.....	4
109793	Havsbøen, Norway, 120 fathoms.....	G. O. Sars.....	1
109794	North Sea.....	Lovèn.....	2
109792	North Sea.....	Jeffreys.....	4
109771	North of Scotland, 345 fathoms.....	Porcupine Exp.....	15
109772	North of Scotland.....	Porcupine Exp.....	2
109773	North of Scotland.....	Porcupine Exp.....	10
109774	North of Scotland.....	Porcupine Exp.....	2
109775	North of Scotland, 250 fathoms.....	Porcupine Exp.....	1
109776	North of Scotland.....	Porcupine Exp.....	2
109777	Mull, Zetland.....	Porcupine Exp.....	12
109778	Shetlands.....	Jeffreys.....	8
109780	Northwest of Ireland.....	Porcupine Exp.....	3
109781	Southwest of Ireland.....	Porcupine Exp.....	3
110862	North Atlantic, 345 fathoms.....	Porcupine Exp.....	4
109782	West of Cape Finistère.....	Porcupine Exp.....	3
109784	West of Cape Finistère.....	Porcupine Exp.....	1
109783	West of Cape Finistère, 567 fathoms.....	Porcupine Exp.....	2
130329	Bay of Biscay, 277 fathoms.....	Travailleur Exp.....	2
109785	Bay of Biscay, 277 fathoms.....	Porcupine Exp.....	Frag.
109786	West of Portugal.....	Porcupine Exp.....	

This was confused by Jeffreys with *Terebratula septata* Philippi, on account of superficial similarity, but by careful methods Seguenza was able to show that the latter species was not even congeneric. The external characters of many brachiopods are so similar that only an examination of the interior characters suffices to reveal their true relations.

DALLINA FLORIDANA Pourtalès.

Waldheimia floridana POURTALÈS, Bull. Mus. Comp. Zool., vol. 1, p. 127, 1868.—

DALL, Bull. Mus. Comp. Zool., vol. 3, p. 12, pl. 1, fig. 3; pl. 2, figs. 1, 2, 3, 1871.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 59, pl. 12, figs. 1-5, 1887.

Dallina floridana BEECHER, Trans. Conn. Acad., vol. 9, p. 382, pl. 1, fig. 45, 1893.

Type locality.—Off the Florida reefs between 100 and 200 fathoms, rocky bottom. Pourtalès.

Cat. No.	Locality.	Collector.	Number of specimens.
110861	Gulf Stream, 200 fathoms.....	Pourtales.....	6
110863	Gulf Stream, 150 fathoms.....	Pourtales.....	6
110860	Off Fernandina, Florida, 270 fathoms.....	B. F.....	1 v.
110858	Florida Keys.....	Str. <i>Fishhawk</i>	5
110859	Florida Keys.....	Str. <i>Fishhawk</i>	9
274188	Off Sand Kay, 115 fathoms.....	Henderson.....	1 v.
274189	Off the Sambos, 120 fathoms.....	Henderson.....	5
274190	Off the Sambos, 135 fathoms.....	Henderson.....	2
274191	Off the Sambos, 118 fathoms.....	Henderson.....	1
274192	Off the Western dry reefs, 144 fathoms.....	Henderson.....	1
107527	Off Key West, 90 fathoms.....	Nutting.....	3
173495	Gulf of Florida.....	Pourtales.....	3
173494	Gulf of Mexico.....	A. Agassiz.....	5
173496	Gulf of Mexico.....	A. Agassiz.....	1
64256	Off Bahia Honda, Cuba, 310 fathoms.....	Blake.....	1
226291	Mayaguez Harbor, Porto Rico, 224 fathoms.....	B. F.....	2

This like the other species of *Dallina* has a pedicel valve with a depression mesially, terminating in a protractive arcuation of the anterior margin, and two more or less obvious depressions in the brachial valve, with a medial low convexity between them or, as it has been called, "dorsal biplication." There are no props to the dental plates nor septum in the pedicel valve, the foramen is entire; in the brachial valve there is a platform between the stems of the crura supported by a prominent medial septum. The cardinal process is short, wide, and feeble.

There is more or less variation in relative width and strength of plication, but on the whole the species is very constant in its characters.

DALLINA RAPHAELIS Dall.

Waldheimia raphaelis DALL, Amer. Journ. Conch., vol. 6, p. 111; pl. 7, figs. *a-e*, 1870.—DAVIDSON, Proc. Zool. Soc., 1871, p. 303, pl. 31, fig. 9; Mon. Rec. Brach., pt. 1, p. 58, pl. 11, figs. 11-13, 1886.

Dallina raphaelis BEECHER, Trans. Conn. Acad., vol. 9, p. 382, 1893.

Type locality.—Japanese coast near Yeddo; Raphael Pumpelly. Also the variety was found by Döderlein in Sagami Bay, in 100 to 200 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
110845	Near Yeddo.....	Pumpelly.....	Type.
110846	Japan.....	Ward.....	1
110792	Kagoshima Gulf, 105 fathoms.....	B. F.....	1

DALLINA RAPHAELIS ALBIDA, new variety.

110784	Off Honshiu Island, 45 fathoms.....	B. F.....	9
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The type and other specimens originally described are of a rather dark warm brown but one lot of specimens obtained by the Bureau of Fisheries steamer *Albatross* is pure white and the contrast is so well marked that a varietal name seems appropriate. There is a median coil to the brachia and the cardinal process is inconspicuous. Davidson's figures 11a-c seem to be taken from a specimen of the variety and figures 12 and 13 from the typical forms of the species.

PEREUDESIA, new subgenus.

This differs from *Magellania* by the incomplete foramen, broad hinge area, and the presence of props to the hinge teeth in the pedicel valve. It differs from *Eudesia* by its incomplete foramen and broad hinge area, and from both by the heavy coarse structure of the shell.

Type.—*Terebratula grayi* Davidson.

PEREUDESIA GRAYI Davidson.

Terebratula grayi DAVIDSON, Proc. Zool. Soc., 1852, p. 76, pl. 4, figs. 1-3.

Terebratula (Waldheimia) grayi SCHRENCK, Reisen in Amurl., p. 465, 1856.—REEVE, Conch. Icon. *Terebratula*, pl. 2, figs. 5 a-c, 1860; Journ. de Conchyl., vol. 9, p. 123, 1861.

Waldheimia grayi DAVIDSON, Mon. Rec. Brach., pt. 1, p. 54, pl. 10, figs. 1-3, 1886. Not of Carpenter, Suppl. Rep. Brit. Assoc., p. 636, 1864. •

W. grayi var. *transversa* DAVIDSON, Mon. Rec. Brach., pt. 1, pl. 10, figs. 4, 4a-b, 1886.

? *Magasella gouldii* DALL, in Davidson, Proc. Zool. Soc., 871, p. 307, pl. 21, figs. 11a-c.

Type locality.—Korea Strait in 37 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
1651	Hakodate Bay, Japan.....	Stimpson.....	4
111080	Hakodate Bay, Japan.....	Morse.....	3
274195	Hakodate Bay, Japan.....	Morse.....	Many yo.
274194	Japan.....	Morse.....	
110884	Japan.....	F. Stearns.....	2
274193	Hirado, Hizen, Japan.....	Hirasé.....	3
162575	Hirado, Hizen, Japan.....	Hirasé.....	3
274196	Otaru, Japan.....	Morse.....	4 yo.
274197	Matsushima, Japan.....	Morse.....	2

No. 110884 represents Davidson's variety *transversa*, which externally is exactly like the red transverse variety of *Terebratalia caurina* Gould, and the two were confounded by Cooper and Carpenter in their early reports on the mollusca of the northwest coast. *P. grayi* does not occur in the latter region, though formerly reported from there, owing to the above-mentioned confusion. The cardinal process is very short wide and transversely rugose. The shell is ventrally uniplicate like *T. caurina*.

Subfamily MAGELLANIINAE.

Genus MAGELLANIA Bayle.

Magellania BAYLE, Journ. de Conchyl., vol. 28, p. 240, 1880; new name for *Waldheimia* King, Perm. fos., pp. 81, 145, 1850; not *Waldheimia* Borelle, 1846, Insecta.

Type.—*Terebratula flavescens* Lamarck.

MAGELLANIA FLAVESCENS Lamarck.

Terebratula flavescens LAMARCK, Anim. s. Vert., vol. 6, p. 246, 1819.—REEVE, Conch. Icon., *Terebratula*, pl. 1, pl. 2, figs. 1 *a-b*, 1860.

Terebratula dentata LAMARCK, Anim. s. Vert., vol. 6, p. 246, 1819.

Terebratula australis QUOY and GAIMARD, Voy. *Astrolabe*, Zool., p. 551, pl. 85, figs. 1-5, 1834.—SOWERBY, Thes. Conch. *Terebratula*, p. 349, pl. 69, figs. 25-33, 1847.

Terebratula recurva QUOY and GAIMARD, Voy. *Astrolabe*, Zool., p. 554, pl. 85, figs. 10-11, 1834.—SOWERBY, Thes. Conch. *Terebratula*, p. 350, pl. 69, figs. 34-36, 1847.

Terebratula incurva DAVIDSON, Mon. Rec. Brach., pt. 1, p. 41, 1886, in synonymy.

Waldheimia australis KING, Perm. foss., p. 145, pl. 20, figs. 10-12, 1850.—HANCOCK, Philos. Trans. Royal Soc., vol. 148, p. 791, 1858.

Waldheimia flavescens DAVIDSON, Brit. foss. Brach., pt. 1, p. 64, figs. 6 and 7, 1853.—DALL, Amer. Journ. Conch., vol. 6, p. 108, figs. 5-9, 1870.—DOUVILLÉ, Bull. Soc. Geol. de France, ser. 3, vol. 7, p. 25, fig. 13, 1879.—DAVIDSON, *Challenger* Brach., p. 41, pl. 3, figs. 10-12, 1880; Mon. Rec. Brach., pt. 1, p. 41, pl. 7, figs. 6-19, text figs. 3-8, 1886.

Terebratula spadæ ARADAS, Atti Accad. Gioenia, vol. 4, 1847, p. 107, 1847; (exotic specimen erroneously reported from Sicily).

Type locality.—Java, according to the book, but Davidson states that Valenciennes who wrote the diagnosis for the then blind Lamarck, asserted that the specimen came from Port Jackson, South Australia, which is probably correct. The specimen supposed to come from Sicily and described by Aradas, was undoubtedly exotic. According to Tenison Woods the species is abundant on the south Australian coast but in Tasmania occurs only on the northern shore.

Cat. No.	Locality.	Collector.	Number of specimens.
17814	Australia.....	U. S. Expl. Exp....	4
11892	Australia.....	Damon.....	4
110881	Australia.....	Dall.....	2
77275	Australia.....	Dr. Stearns.....	2
274200	South Australia.....	Bednall.....	3
64337	South Australia.....	Dr. Stearns.....	2 yo.
75927	Sydney, New South Wales.....	Cox.....	6
76411	Fort Jackson.....	Beadle.....	2
274198	Spencer Gulf.....	S. Smith.....	3
274199	Victoria, Australia, 6-11 fathoms.....	Hanshaw.....	3
173493	Moreton Bay.....	Flower.....	1
102042	Tasman Strait.....	Dr. Stearns.....	1
110882	Southern Chile.....	U. S. Expl. Exp....	2

The young of this species are often smooth but can always be distinguished from the young of *M. kerguelensis* by the entire foramen and produced beak. In the latter species the foramen is open from the beginning and the beak in the adult less produced and much more incurved than in *M. flavescens*. There is often some uncertainty as to the accuracy of the localities for the shells of the United States Exploring Expedition, for reasons I have explained elsewhere, so some doubt attaches to the specimens of undoubted *M. flavescens* labeled from Patagonia, now southern Chile, above cited.

MAGELLANIA KERQUELENENSIS Davidson.

Waldheimia kerguelensis DAVIDSON, Proc. Royal Soc., vol. 27, p. 437, 1878 (err. typ.); *Challenger* Brach., pl. 3, figs. 1-9, 1880.

Waldheimia kerguelensis DAVIDSON, *Challenger* Brach., p. 40, 1880; Mon. Rec. Brach., pt. 1, p. 53, pl. 10, figs. 7-17, 1886.

? *Terebratula globosa* SOWERBY, Thes. Conch. *Terebratula*, pl. 71, figs. 99-101, 1847; cf. Davidson, Chall. Brach., p. 41.

Type locality.—Kerguelen Islands., *Challenger* Expedition.

Cat. No.	Locality.	Collector.	Number of specimens.
110803	Off Kerguelen, 150 fathoms.....	Sowerby.....	1

MAGELLANIA JOUBINI Blochmann.

Magellania joubini BLOCHMANN, Zool. Anz., vol. 30, p. 677, 1906.

Type locality.—Near the winter quarters of the Gauss Antarctic Expedition in 209 fathoms.

Three young specimens (Cat. No. 110440) were received from Blochmann, who thinks that the young brachiopod collected by the Belgica Expedition in latitude 80° W. and figured by Joubin in his report on the brachiopoda (pl. 2, figs. 16, 17) in 1902, is identical, thus indicating that the species is circumpolar.

In this connection it may be mentioned that among the shells sent by Colonel Turton from Saint Helena Island was a young *Magellania* (Cat. No. 124859) of indeterminable species, but naturally resembling the very young of *M. joubini*.

Subgenus NEOTHYRIS Douvillé.

Neothyris DOUVILLÉ, Bull. Soc. Géol. de France, sér. 3, vol. 7, p. 277, 1879.

MAGELLANIA (NEOTHYRIS) VENOSA Solander.

Anomia venosa SOLANDER, Portland Cat., p. 166, No. 3609, 1786 (name only); Dixon's Voy., p. 355, pl. 11, fig. 3, 1789.

Anomia caput-serpentis SOLANDER, in Mus. Calonnianum, p. 45, in synonymy; 1797, not of Linnaeus, 1758.

Terebratula sp., BRUGUIÈRE, Encycl. Méth., vol. 1, pl. 239, fig. 2, 1798.

Terebratula globosa LAMARCK, An. s. Vert., vol. 6, p. 246, 1819.

- Terebratula dilatata* LAMARCK, An. s. Vert., vol. 6, p. 245, 1819.
- Terebratula gaudichaudi* BLAINVILLE, Dict. Sci. Nat., vol. 53, p. 136, 1828; not of Gray, Griffith's Cuvier, vol. 12, p. 132, pl. 4, figs. 2, 2a, 1833 (= *T. lenticularis* Deshayes).
- Terebratula globosa* BLAINVILLE, Malac., pl. 52, fig. 2, 1826.—REEVE, Conch. Icon., *Terebratula*, pl. 2, figs. 3a-c, 1860; pl. 6, figs. 3d-c, 1861.
- Terebratula dilatata* REEVE, Conch. Icon., *Terebratula*, pl. 2, figs. 2, 1860; pl. 6, figs. 2b, 2c, 1861.
- Terebratula physema* VALENCIENNES, in Reeve, Conch, Icon., *Terebratula*, pl. 6, figs. 23a-c, 1861.
- Waldheimia venosa* DAVIDSON, Ann. Mag. Nat. Hist., ser. 3, vol. 8, p. 36, 1861.—DALL, Amer. Journ. Conch., vol. 6, p. 109, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 182.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 49, pl. 8, figs. 1-6, 1886.
- Terebratula eximia* PHILIPPI, in Conch. Cab., ed. 2, *Terebratula*, p. 39, pl. 2d., figs. 9, 10, 1843.
- Terebratula fontaineana* ORBIGNY, Voy. Amer. MÉR., vol. 5, p. 675, pl. 85, figs. 30, 31, 1847.
- Terebratula pulvinata* GOULD, Proc. Boston Soc. Nat. Hist., vol. 3, p. 347, Dec. 1850; U. S. Expl. Exped., Shells, p. 468, pl. 44, fig. 581, 1857.
- Waldheimia pulvinata* GOULD, emend., Otia Conch., p. 97, 1862.
- Terebratella pulvinata* CARPENTER, Checklist West Coast shells, p. 1, 1860.—DALL, Amer. Journ. Conch., vol. 6, pt. 2, p. 117, 1870 (young shell in *Terebratella* stage).
- Magasella laevis* DALL, Amer. Journ. Conch., vol. 6, pt. 2, p. 136, pl. 6, figs. 9, 10, 13, 1870 (young in *Magasella* stage).
- ? *Terebratula malvinæ* ORBIGNY, Voy. Am. MÉR., vol. 5, p. 674, pl. 85, figs. 27-29 1846 (*Magasella* stage).

Type locality.—Falkland Islands.

Cat. No.	Locality.	Collector.	Number of specimens.
5963 ¹	Patagonia.....	U. S. Expl. Exped..	2
11782 ²	Patagonia.....	U. S. Expl. Exped..	2
17813	Orange Harbor, Patagonia.....	U. S. Expl. Exped..	7
110922	Orange Harbor, Patagonia.....	Dall.....	7
96201	Magellan Strait, 20 fathoms.....	B. F.....	2
110923	Magellan Strait, 51 fathoms.....	B. F.....	2
110924	Magellan Strait, 61 fathoms.....	B. F.....	9
110925	Magellan Strait, 61 fathoms.....	B. F.....	5

¹ Types of *T. pulvinata* Gould.

² Types of *Magasella laevis* Dall.

This species ranges from Coquimbo, Chile, to the Straits of Magellan and the Falkland Islands.

There is an interesting succession indicated, beginning with the Tertiary *Terebratella tehuelca* of von Ihering, from the Cape Fair-weather beds, for which he proposed the generic name *Pachymagas*, and which retains the terebratelliform loop until of a very large size, but finally loses it and proceeds to a point where its cardinalia and adjacent parts and cardinal process are loaded thickly with callous deposits. The beak is also much prolonged and the foramen quite

entire. This is followed by *T. lenticularis* Deshayes, in which the loop becomes free from the septum much sooner, the beak is lower and the callous deposits in the adult, though exactly analogous to those of the fossil, are less abundant and crude; and finally the present species in which the beak is still lower and in some old specimens the foramen is not entirely closed, the loop becomes free of the septum at a still earlier stage, and the cardinalia never attain the callosified condition of its predecessors. I conclude from this that *T. venosa*, though *lenticularis* survives, is the newer development of the two. I suspect that the shell figured by Reeve as the original *dilatata* of Lamarck, which always has a large incomplete foramen and more transverse form, is a distinct species.

MAGELLANIA (NEOTHYRIS) LENTICULARIS Deshayes.

Terebratula lenticularis DESHAYES Revue Zool. Soc. Cuvierienne, May, 1839, p. 359.—GUERIN, Mag. de Zool. for 1841, pl. 45.—SOWERBY, Thes. Conch., *Terebratula*, p. 360, pl. 41, figs. 108–110, 1847.—REEVE, Conch. Icon., *Terebratula*, pl. 2, fig. 4, 1860.

Terebratula gaudichaudii GRAY, in Griffith's Cuvier, pl. 4, fig. 2, 1833; not of Blainville, 1828.

Waldheimia lenticularis GRAY, Cat. Brach. Brit. Mus., p. 58, 1853.—DALL, Proc. Acad. Nat. Sci. Phila., for 1873, p. 182.—DAVIDSON, Mon. Rec. Brach., pt. 1, p. 52, pl. 9, figs. 2–13, 1886.

Neothyris lenticularis DOUVILLÉ, Bull. Soc. Géol. de France, ser. 3, vol. 7, p. 26, 1880.—J. ALLAN THOMSON, Austr. Antarctic Exp., *Brachiopoda*, p. 25, 1918.

Type locality.—Foveau Straits, New Zealand.

Cat. No.	Locality.	Collector.	Number of specimens.
107729	New Zealand.....	Ward.....	1
110926	Bluff Harbor, New Zealand.....	Dr. Kershner.....	5
195288	Stewart Island, New Zealand, 18 fathoms....	Suter.....	2
332783	New Zealand.....	Fulton.....	3

The prominent large tridentate cardinal process of this species is a conspicuous feature. It is the type of the subgenus *Neothyris*.

Genus CAMPAGES Hedley.

Campages HEDLEY, Records Austr. Museum, vol. 6, pt. 2, p. 43, figs. 5, 6, Sept. 1905, type, *C. furcifera* Hedley.

Type locality.—East of Cape Byron, New South Wales, in 111 fathoms.

CAMPAGES FURCIFERA Hedley.

Campages furcifera HEDLEY, Records Austr. Museum, vol. 6, pt. 2, p. 43, figs. 5, 6, Sept. 1905.

Type locality.—East of Cape Byron, New South Wales, in 111 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
335704	Gabo Island, New South Wales, 115 fathoms	Hedley.....	1
333010	Gabo Island, New South Wales, 145 fathoms	Hedley.....	2

Externally exactly like *Gryphus fulva* Blochmann, the specimens agree with Hedley's figure of *Campages furcifera*, but have only a feeble anterior fold to the valves, and a longer, narrower, and less funicular loop.

CAMPAGES ASTHENIA, new species.

Shell whitish, rather inflated, subrectangular and moderately elongated, smooth except for lines of growth; punctation conspicuous; beak large, foramen entire, the deltidia completely coalescent with a small ridge medially; hinge teeth strong, short, quite closely adjacent, without props; there is no "collar" or medial ridge in the valve, which anteriorly is squarely prominent as in *C. furcifera* but less emphatically so; two obscure ridges extend back over the valve from the shallow notches at the sides of the prominence; there is a small cardinal process, the cardinalia and loop resemble those of *C. furcifera*; the septum extends forward as far as the anterior extremity of the loop. Height of shell 21; breadth 15; diameter 10 mm.

Type locality.—U. S. Bureau of Fisheries station 5172, off Jolo, Philippines, in 318 fathoms, sand; one specimen and a fragment.

Cat. No.	Locality.	Collector.	Number of specimens.
111061	Off Jolo, Philippines, 318 fms.....	B. F.....	Type.
299785	Sibuko Bay, Borneo, 347 fms.....	B. F.....	2 v.

This agrees in its characters with *C. furcifera* but is less arcuate, has a much feebler fold, and the anterior part of the loop is less elevated.

CAMPAGES BASILANICA, new species.

Shell small, shaped much like *Megerlia willemoesi* Davidson, yellowish white, smooth, with conspicuous punctation, rather solid for its size, inflated; pedicel valve with a short stout beak, complete foramen, narrow inconspicuous deltidia, short slender hinge teeth rather close together, no props, "collar," or septum; the fold comprising a wide sulcus on either side of a small low-arched prominence; the sides of the valve prominently arcuate; brachial valve with undivided cardinal platform very short and concave, the loop large for the size of the shell, formed as in *C. furcifera* but without lateral

perforations, the septum extends as far forward as the loop; genital sinuses in two small reticulate groups on each side of the posterior half of the pedicel valve. Height of shell 14.0; breadth 11.0; diameter 10.5 mm.

Type locality.—Kagoshima Gulf, Japan, in 103 fathoms.

Cat. No.	Locality.	Collector.	Number of specimens.
204667	Kagoshima Gulf, 103 fathoms.....	B. F.....	1
110546	Japan Sea, 361 fathoms.....	B. F.....	1
204668	Korea Strait, 59 fathoms.....	B. F.....	1
297610	Balabac Island, Philippine Islands, 68 fathoms.	B. F.....	1
236595	Off Basilan, Philippine Islands, 78 fathoms....	B. F.....	1
299438	Tawitawi Islands, Philippine Islands, 240 fathoms.	B. F.....	1
294719	Off North Burias, Philippine Islands, 105 fathoms.	B. F.....	2
111060	Off North Burias, Philippine Islands, 105 fathoms.	B. F.....	1
294621	Off Jolo, Philippine Islands, 161 fathoms.....	B. F.....	3
295880	Off West Luzon, Philippine Islands, 170 fathoms.	B. F.....	2
300322	Off Celebes, 700 fathoms.....	B. F.....	1
296886	Off Pratas Island, China Sea, 122 fathoms....	B. F.....	1 v.
297041	Off Pratas Island, China Sea, 230 fathoms....	B. F.....	6 v.
296726	Off Pratas Island, China Sea, 150 fathoms....	B. F.....	1 v.

This externally resembles *T. mariae* A. Adams but is folded in the contrary direction.

CAMPAGES (JOLONICA) HEDLEYI, new species.

Shell subcircular, smooth except for lines of growth, with minute, not very dense punctation, of a whitish color and rather delicate structure; pedicel valve with a rather short beak and entire foramen, short and slender deltidia, strong hinge teeth rather close together and supported by their props with ample cavities between them and the shell wall; there is a feeble "collar" and a very short but distinct septal ridge ending anteriorly in a small knob from which two shallow divergent furrows extend forward nearly to the anterior edge of the valve; there is a very slight squarish depression anteriorly to receive a corresponding prominence from the brachial valve; the latter is subcircular with a small distinct rugose concave cardinal process; the cardinal plate is divided clear to the apex of the valve, the dental sockets are deep and the inner lamina curved over so as to make the socket resemble a split tube from which the teeth of the other valve can not be disengaged without fracture; there is a groove between the laminae and the stem of the crura which are short and widely triangular, the lower limb of the loop continuous with the upper limb; the sharp rather high septum extends from

below the cardinal process to the middle of the valve, ceasing abruptly; there is a deep squarish notch in the posterior edge of the upper limb of the loop, and below this the opening which usually exists in this place is entirely closed by a calcareous plate, while the distal ends of the lower limbs of the loop project as two small unattached points about 2 millimeters long. Height of the shell 18.0; breadth 18.0; diameter 9.5 mm. U. S. Nat. Mus. Cat. No. 111059.

Type locality.—U. S. Bureau of Fisheries station 5172, off Jolo, Philippines, in 318 fathoms, sand; one specimen and a fragment.

I have some hesitation in referring this species to *Campages* on account of the props in the pedicel valve (which Hedley does not refer to and are presumably absent in the *C. furcifera*), the divided cardinal plate and the projecting spurs of the lower part of the loop. Otherwise the resemblance is close. The closed aperture I presume is due to coalescence of spicules, but this demands more material to determine. Meanwhile attention may be called to its peculiarities by regarding it as a section of the genus. The specimen described was dead when dredged but retained the loop uninjured.

CAMPAGES JAFFAËNSIS Blochmann.

Magasella jaffaënsis BLOCHMANN, Trans. Royal Soc. of South Australia, vol. 34, p. 92, pl. 27, figs. 6-9, 1910.

Campages jaffaënsis HEDLEY, Zool. Results Ex. F. I. S. *Endeavor*, pt. 1, p. 114, pl. 20, figs. 41-42, 1911.—ALLAN THOMSON, Geol. Mag., dec. 6, vol. 3, p. 500, Nov. 1916.

Type locality.—Cape Jaffa, South Australia, in 90 fathoms. Doctor Verco.

Cat. No.	Locality.	Collector.	Number of specimens.
214306	Beachport, South Australia, 150 fathoms.....	Verco.....	3

There is no doubt this should be included in *Campages*.

Genus MAGASELLA Dall.

Magasella DALL, Amer. Journ. Conch., vol. 6, p. 134, 1870.

Type.—*Terebratula flexuosa* King. Magellan Straits.

The type upon which this group was originally based was supposed to be *Terebratella evansi* Davidson, 1852. A recent study of the material upon which my original diagnosis was based shows that the specimens really belong to the *T. flexuosa* of King, 1831.

The confusion which reigned in the period just previous to and somewhat after the epoch-making discovery of Friele, in regard to the changes which take place in the form of the loop, during the development of the Terebratelloid brachiopods, was very great and affected all our synonymy.

It was not at first understood that certain species stopped short in their development at particular stages while others reaching that stage continued their evolution. In fact the confusion, or perhaps it would be better to say the doubtful points, are not yet entirely cleared up.

Our series of *Terebratella dorsata* is quite small and perhaps should not form the basis of any dogmatic opinion, but from the material which has passed through my hands I feel confident that *T. flexuosa* King is distinct, adult, and not a stage of *T. dorsata*, as it has been sometimes regarded. In this opinion I am supported by the views of Davidson and Ihering.

On the other hand *T. evansi* and *T. valenciennesi*, of which I have never seen authentic specimens, are admitted by Davidson and the majority of writers to be developmental stages of *T. dorsata* or some other similar species.

Still another form, which by some authors is regarded as a mutation of *T. dorsata*, seems distinct, as I have already indicated under the head of *T. sowerbii* King.

In 1891.¹ I indicated the probable relations of the various small species of *Magasella* then known, and not much can be added even now, to that statement. The few species of doubtful relations will here be considered separately.

MAGASELLA FLEXUOSA King.

Terebratula flexuosa KING, Zool. Journal, vol. 6, p. 337, 1831.—SOWERBY, Thes.

Conch., vol. 1, p. 347, pl. 69, figs. 23-24, 1847.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 367, 1852.

Magasella flexuosa DALL, Amer. Journ. Conch., vol. 6, p. 135, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 189.

Magasella evansi DALL, Amer. Journ. Conch., vol. 6, p. 134, 1870, not of Davidson, 1852.

Terebratula rhombea PHILIPPI, Arch. f. Naturg., vol. 11, pt. 1, p. 59, 1845; (according to Davidson) Mon. Rec. Brach., pl. 17, figs. 6-8 a, 1887.

Magasella flexuosa DAVIDSON, *Challenger* Brach., p. 46, pl. 4, fig. 5, 1880; Mon. Rec. Brach., pt. 2, p. 92, pl. 17, figs. 1-5, 1887.

Type locality.—Port Famine, Magellan Strait. Captain King.

Cat. No.	Locality.	Collector.	Number of specimens.
11783	Orange Harbor, Patagonia.....	U. S. Exp. Ex.....	1
17822	Orange Harbor, Patagonia.....	U. S. Exp. Ex.....	1
96221	Magellan Strait, 61 fathoms.....	B. F.	6
332787	Magellan Strait.....	Fulton	1

I have expressed under the heading of the genus my opinion as to the distinctness of this species, which appears to me to have

¹ Proc. Acad. Nat. Sci. Phila. for 1891, p. 170.

reached its maturity retaining the *Magasella* characters. It is proper to say, however, that the series I have had for study has been small, and the subject is still open for further researches.

MAGASELLA VERCOI Blochmann.

Magasella vercoi BLOCHMANN, Trans. Roy. Soc. S. Austr., vol. 34, pp. 90, 93, pl. 27, figs. 1-5, 1910.

Megerlia willemoesi TATE, Trans. Roy. Soc. S. Austr., vol. 9, p. 110, 1886; not of Davidson.

Type locality.—Backstairs Passage, near Adelaide, South Australia, in 15 to 22 fathoms. Doctor Vercó.

Cat. No.	Locality.	Collector.	Number of specimens.
214307	South Australia, 22 fathoms.....	Vercó.....	3
111055	South Australia	Vercó.....	2

Genus TEREBRATELLA Orbigny.

Terebratella ORBIGNY, Comptes Rendus Acad. Sci., vol. 25, p. 269, 1847; Pal. Franc. Ter. Crét., vol. 4, p. 110, 1847.

Type.—*Terebratula chilensis* Broderip.

TEREBRATELLA DORSATA Gmelin.

Anomia striata magellanica CHEMNITZ, Conch. Cab., vol. 8, p. 101, pl. 78, figs. 710, 711, 1785. (Non-binomial).

Anomia dorsata GMELIN, Syst. Nat., vol. 4, p. 3348, 1792.—BRUGUIÈRE, Encycl. Méth., pl. 242, figs. 4 a-c, 1798.

Anomia striata BOLTEN, Mus. Bolt., p. 192, No. 417, 1798.

Anomia dorsata DILLWYN, Descr. Cat. Rec. Sh., vol. 1, p. 295, 1817.

Terebratula dorsata LAMARCK, Anim. s. Vert., vol. 6, pt. 1, p. 246, 1819.—ORBIGNY, Voy. Am. Mér. Moll., p. 675, 1846.—SOWERBY, Thes. Conch., vol. 1, p. 346, 68, figs. 15-17, 1847.—VON MARTENS, Mal. Blätt., 1872, pp. 9, 58.

Terebratula chilensis BRODERIP, Trans. Zool. Soc., vol. 1, p. 141, pl. 22, figs. 1, 3-11, 1833.—OWEN, Trans. Zool. Soc., vol. 1, p. 145.

Terebratella chilensis ORBIGNY, Pal. Franc. Ter. Crét., vol. 4, p. 110, 1847.

Terebratula patagonica GOULD, Proc. Boston Soc. Nat. Hist., vol. 3, p. 347, 1850; U. S. Expl. Exp., Moll., p. 469, pl. 44, figs. 582 a-c, 1852; not of Sowerby, in Darwin, Geol. Obs., p. 253, 1846.

Terebratella dorsata H. and A. ADAMS, Gen. Rec. Moll., vol. 3, p. 576, pl. 130, figs. 4 4 a., 1858.—CHENU, Man. de Conchyl., vol. 2, p. 204, figs. 1043, 1045, 1862.—DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 184.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 75, pl. 14, figs. 9-19, 1887.

Terebratula (Terebratella) magellanica REEVE, Conch. Icon., *Terebratula*, pl. 5, figs. 21 a-c, 1860; Journ. de Conchyl., vol. 9, p. 127, 1861 (ex parte).

Waldheimia patagonica GOULD, Otia Conch., p. 246, 1862.

Magasella patagonica DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 189.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 99, pl. 17, figs. 12-13 a., 1887.

Type locality.—Magellan Straits.

Cat. No.	Locality.	Collector.	Number of specimens.
17815	Orange Harbor, Patagonia.....	U. S. Expl. Exp....	1
332786	Magellan Straits.....	Fulton.....	5

TEREBRATELLA SOWERBII King.

Terebratula sowerbii KING, Zool. Journ., vol. 5, p. 338, 1831; (not of Owen, Trans. Zool. Soc., vol. 1, p. 49, pl. 22, figs. 15, 16, 1833).—SOWERBY, Thes. Conch., *Terebratula*, pl. 68, figs. 20, 22, 1847.

Terebratella dorsata DAVIDSON, (ex parte) *Challenger* Brach., p. 44, pl. 4, fig. 4, 1880; Mon. Rec. Brach., vol. 2, p. 77, pl. 14, fig. 12 ?, 1887.

Terebratella dorsata var. *submutica* FISCHER and OEHLERT, Mission Cap Horn. Brach., Bull. Soc. d'hist. Nat. d'Autun, vol. 5, p. 27, pl. 11, figs. 1-6, 1892.

Terebratella enzenspergeri BLOCHMANN, Zool. Anzeiger, vol. 30, p. 697, 1906.—EICHLER, Brach. Deutsche Sud Polar Exp., p. 392, pl. 42, figs. 10 a-b, 11 a-d, 12, 1911.

Type locality.—Magellan Straits. Captain King.

Cat. No.	Locality.	Collector.	Number of specimens.
110936	Magellan Straits, 20 fathoms.....	B. F.....	10
110937	Magellan Straits, 61 fathoms.....	B. F.....	20 yo.
106873	Magellan Straits, 61 fathoms.....	B. F.....	1 yo.

This seems to me distinct from the smooth variety of *Terebratella dorsata* with which it was associated by Davidson and Fischer. The species dissected and figured by Owen was undoubtedly the *dorsata*, judging by his figures, though referred to as *sowerbii* in his text.

TEREBRATELLA SANGUINEA Leach.

Terebratula sanguinea LEACH, Zool. Misc., vol. 1, p. 76, pl. 33, 1815.—CHENU, Bibl. Conchyl., Leach, p. 12, pl. 4, fig. 1, 1845.—DONOVAN, Nat. Rep., vol. 1, pl. 34, 1823.

Anomia sanguinea SOLANDER, MS. in Mus. Calonnianum, 1797.

? *Lampas sanguinea* (anonymous) Mus. Calonnianum, p. 45, No. 836, 1797 (nude name).

Anomia cruenta DILLWYN, Descr. Cat. Rec. Sh., vol. 1, p. 295, No. 25, 1817.

Terebratula zelandica DESHAYES, Rev. Zool. Soc. Cuvierienne, p. 359, 1839.—GUERIN, Mag. de Zool., Moll., pl. 42, 1841.—G. B. SOWERBY, Thes. Conch., vol. 1, p. 361, pl. 72, figs. 111 to 113, 1847.

Terebratula rubra SOWERBY, Thes. Conch., vol. 1, p. 345, p. 68, figs. 9-11, 1847; not of Pallas, 1766.

Terebratula zelandica DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 2, p. 367, 1852.

Terebratula evansi DAVIDSON, Proc. Zool Soc. for 1852, p. 77, pl. 14, figs. 7-9.—REEVE, Conch. Icon., *Terebratula*, pl. 8, fig. 31, 1861.

Terebratella cruenta GRAY, Cat. Brach. Brit. Mus., p. 89, 1853.—REEVE, Conch., Icon., *Terebratula*, pl. 5, fig. 20 a-b, 1860.—DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 183.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 87, pl. 14, figs. 1-8, 1887.

Magasella evansi DALL (ex parte) Amer. Journ. Conch., vol. 6, p. 134, 1870.

? *Waltonia valenciennesi* DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 5, p. 475, pl. 15, figs. 1, a-d, 1850;

Type locality.—New Zealand.

Cat. No.	Locality.	Collector.	Number of specimens.
11895	Wellington, New Zealand.....	Colonial Mus.....	4
11896a	Bluff Harbor, New Zealand.....	Dr. Kershner.....	9

This fine species, except in color, is very close to *T. dorsata*. The *Magasella evansi* is now believed to be its *Magasella* stage. The *Waltonia* may also belong here, but representing a still earlier stage of development, common to several species, it can hardly be positively identified, though Mr. Davidson's last surmise allotted it to *T. rubicunda*.

TEREBRATELLA INCONSPICUA Sowerby.

Terebratula sanguinea QUOY and GAIMARD, Voy. *Astrolabe*, Zool., vol. 3, p. 556, pl. 85, figs. 6, 7, 1835; not of Leach, 1815.

Terebratula rubicunda SOWERBY, Proc. Zool. Soc., 1846, p. 92; Thes. Conch., *Terebratula*, p. 351, pl. 70, figs. 45-47, 1847; not of Donovan, Nat. Rep., pl. 56, figs. 2-4, 1823.

Terebratula inconspicua SOWERBY, Proc. Zool. Soc., 1846, p. 93; Thes. Conch., *Terebratula*, p. 359, pl. 71, figs. 103-5, 1847.

Waltonia valenciennesi DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 5, p. 475, pl. 15, fig. 1, 1850; according to Davidson, 1887.

Terebratella rubicunda DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 367, 1852.—REEVE, Conch. Icon., *Terebratula*, pl. 7, fig. 27, 1861.—DALL, Amer. Journ. Conch., vol. 6, p. 117, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 185.

Magasella inconspicua DALL, Amer. Journ. Conch., vol. 7, p. 67, 1871; Proc. Acad. Nat. Sci. Phila. for 1873, p. 189.

Terebratella rubicunda DAVIDSON, Mon. Rec. Brach., pt. 2, p. 84, pl. 15, figs. 15-29, 1887.

Type locality.—New Zealand.

Cat. No.	Locality.	Collector.	Number of specimens.
173490	New Zealand.....	Flower.....	2
77277	New Zealand.....	Stearns.....	1
98955	New Zealand.....	Dr. Kershner.....	15
17823	New Zealand.....	U. S. Expl. Exp....	2v.
17824	New Zealand.....	U. S. Expl. Exp....	7
11897	Sinclair Head, New Zealand.....	Colonial Mus.....	3
110969	Sinclair Head, New Zealand.....	Colonial Mus.....	8
11895	Wellington, New Zealand.....	Colonial Mus.....	10
110968	Stewart Island, New Zealand.....	C. Trail.....	5
253289	Auckland Harbor, New Zealand.....	J. Waite.....	4
76500	Cook Inlet, New Zealand.....	Stearns.....	1
77276	Camp Cove, New South Wales.....	Stearns.....	1

Quoy's name is preoccupied by Leach; Sowerby's *rubicunda* by Solander in Donovan, hence we must take Sowerby's second name given to the immature shell, afterwards described by me as a *Magassella*. Quoy's figure does not represent the attachment to the septum of the descending loop but the cardinalia are accurately figured and there can be no reasonable doubt that this is the species intended. The Australian locality is unexpected and may be inaccurate, but was probably due to one of Stearns' correspondents.

There is a feeble ridge in the pedicel valve hardly to be called a septum. There are no props to the hinge teeth. The foramen is normally entire but frequently open by reason of wear. The brachial valve has usually a prominent squarish cardinal process; a concave platform with a median ridge supported by a strong but low septum which extends to about the middle of the valve, which is retractively strongly uniplicate in some individuals, but not noticeably so in others, while still others have a number of additional minor plications.

TEREBRATELLA RUBIGINOSA Dall.

Terebratella sp. DALL, Amer. Journ. Conch., vol. 6, p. 122, pl. 6, fig. 4, 1870.

? *Terebratella suffusa* REEVE, Dall, Amer. Journ. Conch., vol. 7, p. 65, 1871 (not of Reeve).

Terebratella rubiginosa DALL, Amer. Journ. Conch., vol. 7, p. 65, 1871; Proc.

Acad. Nat. Sci. Phila. for 1873, p. 135.—DAVIDSON, Men. Rec. Brach., pt. 2, p. 91, pl. 16, fig. 19, 1887.

Type locality.—Simons Bay, Cape of Good Hope. W. Stimpson.

Cat. No.	Locality.	Collector.	Number of specimens.
5110	Cape of Good Hope	Stimpson.....	1

The species is entered in the early Smithsonian register with a large number of mollusks collected by Stimpson at the above locality during the Ringgold and Rodgers exploring expedition and I think there is no sufficient reason to doubt its having been part of that collection.

The pedicel valve has a short beak with a large incomplete foramen a hardly perceptible median ridge internally, no dental props, and there are four slender genital sinuses, the inner pair widely separated, simple, bifurcate at the extreme ends; the outer pair with five or six lateral branches on their outer sides.

The brachial valve is very slightly retractively uniplicate. It has a small rugose cardinal process, a concave platform, supported medially by a strong low septum reaching to the middle of the valve, a loop well represented by my figure of 1870; the genital sinuses are

widely separated, a single one on each side, arcuate, with five or six short, bifurcating, lateral, outer branches.

The species can not be united with any other which has come under my notice.

Genus BOUCHARDIA Davidson.

Bouchardia DAVIDSON, Bull. Soc. Géol. de France, sér. 2, vol. 7, pl. 1, figs. 1-6, 1849; Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 372, 1852.—DALL, Amer. Journ. Conch., vol. 6, p. 141, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 191.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 115, 1887.—J. ALLAN THOMSON, Trans. New Zealand Inst., vol. 47, pp. 392-403, 1915; Geol. Mag., dec. 6, vol. 5, No. 648, pp. 258-63, 1918.

Pachyrhynchus KING, Mon. Permian Fos., p. 70, 1852.

Type species.—*Anomia rosea* Mawe.

BOUCHARDIA ROSEA Mawe.

Anomia rosea MAWE, Linnean Syst. of Conch., p. 65, pl. 16, fig. 4, 1823.

Terebratula rosea SOWERBY, Gen. Shells, pt. 15, *Terebratula*, fig. 4, 1823; Tankerville Cat., p. 28, 1825.—ORBIGNY, Voy. Am. Mér., Moll., p. 675, 1846.—SOWERBY, Thes. Conch., *Terebratula*, p. 357, pl. 71, figs. 75-77, 1847.—HANLEY, Recent Biv. Shells, p. 322, 1856.

Terebratula tulipa BLAINVILLE, Dict. Sci. Nat., vol. 53, p. 144, 1828.

Terebratula unguis KÜSTER, Conch. Cab., ed. 2, *Terebratula*, p. 35, pl. 2b, figs. 8-10, 1848.

Bouchardia rosea DAVIDSON, Bull. Soc. Géol. de France, ser. 2, vol. 7, p. 62, pl. 1, figs. 1-6, 1849; Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 372, 1852.—DALL, Proc. Acad. Nat. Sci. Phila. for 1873, p. 191.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 115, pl. 20, figs. 13-18, 1887.

Pachyrhynchus roseus KING, Mon. Permian Fos., p. 70, 1852.

Terebratula (Bouchardia) tulipa REEVE, Conch. Icon., *Terebratula*, pl. 8, figs. 33 a-c, 1861.

Bouchardia tulipa GRAY, Cat. Brach. Brit. Mus., p. 100, 1853.—DALL, Amer. Journ. Conch., vol. 6, p. 141, 1870.

Type locality.—Rio Janeiro, Brazil.

Cat. No.	Locality.	Collector.	Number of specimens.
110951	Rio Janeiro.....	Acad. Nat. Sci.	1
110952	Rio Janeiro, 59 fathoms.....	B. F.	Many v
96129	East of Rio Janeiro, 59 fathoms.....	B. F.	1 v.
212831	East of Rio Janeiro, 59 fathoms.....	B. F.	1 v.
110950	Montevideo.....	Ihering.....	1
332784	Brazil.....	Fulton.....	1

This interesting species appears to be rare, or at least not gregarious like most brachiopods.

Genus MAGADINA Allan Thomson.

Magadina J. ALLAN THOMSON, Trans. New Zealand Inst., vol. 47, p. 399, 1915.

Type.—*M. browni* Thomson, fossil of the Mount Brown beds, Waipara District, New Zealand.

MAGADINA CUMINGII Davidson.

? *Terebratella cumingii* DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 368, 1852; Proc. Zool. Soc., 1852, p. 78, pl. 14, figs. 10-16.

Magas cumingii GRAY, Cat. Brach. Brit. Mus., p. 99, 1853.—H. and A. ADAMS, Gen. Rec. Moll., vol. 2, p. 577, pl. 131, figs. 1, 1 a., 1858.

Terebratula (Bouchardia) cumingii REEVE, Conch. Icon., *Terebratula*, pl. 8, fig. 29, 1861.

? *Terebratula (Bouchardia) fibula* REEVE, Conch. Icon., *Terebratula*, pl. 8, figs. 30 a-b., 1861; DAVIDSON, Mon. Rec. Brach., pt. 2, pl. 17, figs. 33, 33a., 1887.

Magasella cumingii DALL, Amer. Journ. Conch., pt. 6, p. 137, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 188.—DAVIDSON, *Challenger* Brach., p. 48, 1880; Mon. Rec. Brach., pt. 2, p. 97, pl. 17, figs. 23-32, 1887.

Magadina cumingii ALLAN THOMSON, Trans. N. Zealand Inst., vol. 47, p. 400, fig. 12, 1915.

Type locality.—Port Jackson, New South Wales. For *M. fibula*, Bass Straits, New Zealand.

Cat. No.	Locality.	Collector.	Number of specimens.
206480	South Australia.....	Davidson.....	2
128938	Port Jackson, 4 fathoms.....	Brazier.....	3
128939	Port Jackson, 6 fathoms.....	Brazier.....	1
332785	South Australia.....	Fulton.....	4

Subfamily KRAUSSININAE.

Genus KRAUSSINA Davidson.

Kraussia DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 370, 1852.—GRAY, Cat. Brach. Brit. Mus., p. 109, 1853.—H. and A. ADAMS, Gen. Rec. Moll., vol. 2, p. 578, 1858. Not *Kraussia* Dana, *Crustacea*, earlier in 1852.

Kraussina DAVIDSON, in SUSS. Wohnsitze der Brach., vol. 1, p. 28, 1859; Ann. Mag. Nat. Hist., ser. 3, vol. 8, p. 39, 1861.—DALL, Amer. Journ. Conch., vol. 6, p. 138, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 190.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 118, 1887.

Kraussinia PAETEL, Fam. and Gen. of Moll., p. 104, 1875.

Type.—*Anomia rubra* Pallas.

KRAUSSINA RUBRA Pallas.

Anomia rubra PALLAS, Miscel. Zool., p. 182, pl. 14, figs. 2-11, 1766.

Anomia capensis GMELIN, Syst. Nat., p. 3347, 1792.

Terebratula rubicunda DONOVAN, Nat. Repository, vol. 2, pl. 56, figs. 2-4, 1823 (as of Solander MS.; not *T. rubicunda* Sowerby).

Terebratula rubra BLAINVILLE, Dict. Sci. Nat., vol. 53, p. 138, 1828.—SOWERBY, Thes. Conch., *Terebratula*, p. 345, pl. 68, fig. 10, 1847.—REEVE, Conch. Icon., *Terebratula*, pl. 9, fig. 37 a-c., 1861.

Terebratula capensis KÜSTER, Conch. Cab., ed. 2, *Terebratula*, p. 32, pl. 3, figs. 15-17, 1848.—KRAUSS, Sud Airikan. Moll., p. 32, pl. 2, fig. 10, 1848; not of Adams and Reeve, Voy. Samarang, 1850.

Kraussia rubra DAVIDSON, Ann. Mag. Nat. Hist., ser. 2, vol. 9, p. 370, 1852.—GRAY, Cat. Brach. Brit. Mus., p. 109, fig. 19, 1853.

Kraussina rubra SUESS, Wohns. der Brach., p. 210, 1859.—DAVIDSON, Ann. Mag. Nat. Hist., ser. 3, vol. 8, p. 39, 1863.—DALL, Amer. Journ. Conch., vol. 6, p. 138, fig. 17, 1870; Proc. Acad. Nat. Sci. Phila. for 1873, p. 190.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 119, pl. 20, figs. 19–23, 1887.

Terebratula rotundata BLAINVILLE, according to Reeve.

Type locality.—Cape of Good Hope, South Africa.

Cat. No.	Locality.	Collector.	Number of specimens.
17817	Cape of Good Hope.....	Stimpson.....	2
32925	Cape of Good Hope.....	U. S. Expl. Exp....	2
110958	Cape of Good Hope.....	Dall.....	1
98043	Peddle, South Africa.....	Albany Mus.....	4

KRAUSSINA GARDINERI Dall.

Kraussina gardineri DALL, Brach. of the Sea Lark Exped., Trans. Linn. Soc. London, ser. 2, Zool., vol. 13, p. 440, pl. 26, figs. 3–6, 1910.

Type locality.—Indian Ocean, south of the Saya de Malha Banks in 123 to 153 fathoms, station C 1. J. Stanley Gardiner.

Cat. No.	Locality.	Collector.	Number of specimens.
111085	Indian Ocean.....	Sea Lark Exp.....	1

KRAUSSINA NATALENSIS Krauss.

? *Terebratula pisum* LAMARCK, Anim. s. Vert., vol. 6, p. 245, 1819.—DESHAYES, in Lamarck, Anim. s. Vert., ed. 2, vol. 7, p. 330, 1836, not of Sowerby, 1829.

Terebratula natalensis KRAUSS, Sud Afrikan. Moll., p. 33, pl. 2, fig. 11, 1848.—KÜSTER, Conch. Cab., ed. 2, vol. 7, p. 36, pl. 2b, figs. 4–7, 1848.

? *Terebratula algoënsis* SOWERBY, Proc. Zool. Soc., 1846, p. 95; Thes. Conchyl. *Terebratula*, p. 362, pl. 71, figs. 91, 92, 1847.

Kraussia pisum H. and A. ADAMS, Gen. Rec. Moll., vol. 2, p. 579, pl. 131, figs. a–b., 1858.—REEVE, Conch. Icon., *Terebratula*, pl. 9, fig. 36 a–b, 1861.

Kraussina pisum SUESS, Wohnsitz. der Brach., p. 211, 1859.—DALL, Amer. Journ. Conch., vol. 6, p. 140, 1870.—DAVIDSON, *Challenger* Brach., p. 54, pl. 4, figs. 7, 8, 1880; Mon. Rec. Brach., pt. 2, p. 123, pl. 21, figs. 1–4, 1887.

Type locality.—Natal Point, South Africa. Krauss.

Cat. No.	Locality.	Collector.	Number of specimens.
64336	South Africa.....	Krauss.....	1

The *T. pisum* of Lamarck, according to his text, written by Valenciennes on account of Lamarck's blindness, came from Mauritius,

where it was collected by M. Mathieu. It was a smooth subglobular red shell resembling a cherry stone and 9 millimeters broad. These characters do not suggest Krauss's shell. The *algoënsis* of Sowerby was founded on an ovate worn and defective pedicel valve, quite unrecognizable from the figure, and not resembling the transverse *K. natalensis*.

Genus **MEGERLINA** Deslongchamps.

Megerlina DESLONGCHAMPS, Etudes crit. sur les Brach., p. 159, pl. 19, fig. 11, 1884.—DAVIDSON, Mon. Rec. Brach., pt. 2, p. 124, 1887.

Type.—*Kraussia lamarckiana* Davidson.

MEGERLINA LAMARCKIANA Davidson.

Kraussia lamarckiana DAVIDSON, Proc. Zool. Soc., 1852, p. 80, pl. 14, figs. 22, 23.—GRAY, Cat. Brach. Mus., p. 111, 1853.—WOODWARD, Man. Moll., p. 218, fig. 120, 1858.

Trerbratula (*Kraussia*) *lamarckiana* REEVE, Conch. Icon., *Terebratula*, pl. 9, fig. 34, 1861.

Kraussina lamarckiana SUESS, Wohnsitz der Brach., p. 211, 1859.—DALL, Amer. Journ. Conch., vol. 6, p. 139, fig. 18, 1870.—DAVIDSON, *Challenger* Brach., p. 53, pl. 4, figs. 9 a-b, 1880.

Megerlina lamarckiana DESLONGCHAMPS, Etudes crit. sur les Brach., p. 159, pl. 19, fig. 11, 1884.

Kraussina (*Megerlina*) *lamarckiana* DAVIDSON, Mon. Rec. Brach., pt. 2, p. 124, pl. 21, figs. 7-11, 1887.

Type locality.—Sydney, New South Wales, Australia.

Cat. No.	Locality.	Collector.	Number of specimens.
11893	Australia.....	Damon.....	4
101389	Australia.....	Stearns.....	7
75177	Australia.....	Walpole.....	4
160381	South Australia.....	Reed.....	1
110959	Sydney, New South Wales.....	Dall.....	8
173590	Sydney, New South Wales.....	Jeffreys.....	1

This small species is said to exist in large numbers at Port Jackson, in a few feet of water, uncovered at lowest tides. It is reported by Tenison Woods as abundant at Tammi Heads, New Zealand, but no specimens from New Zealand have come under my observation.

NOTE.—I owe to the kindness of Mr. C. Davies Sherborn, of the British Museum, the following dates of issue of Küster's Brachiopoda of the second edition of Chemnitz Conchylien Cabinet, which are not dated in the original:

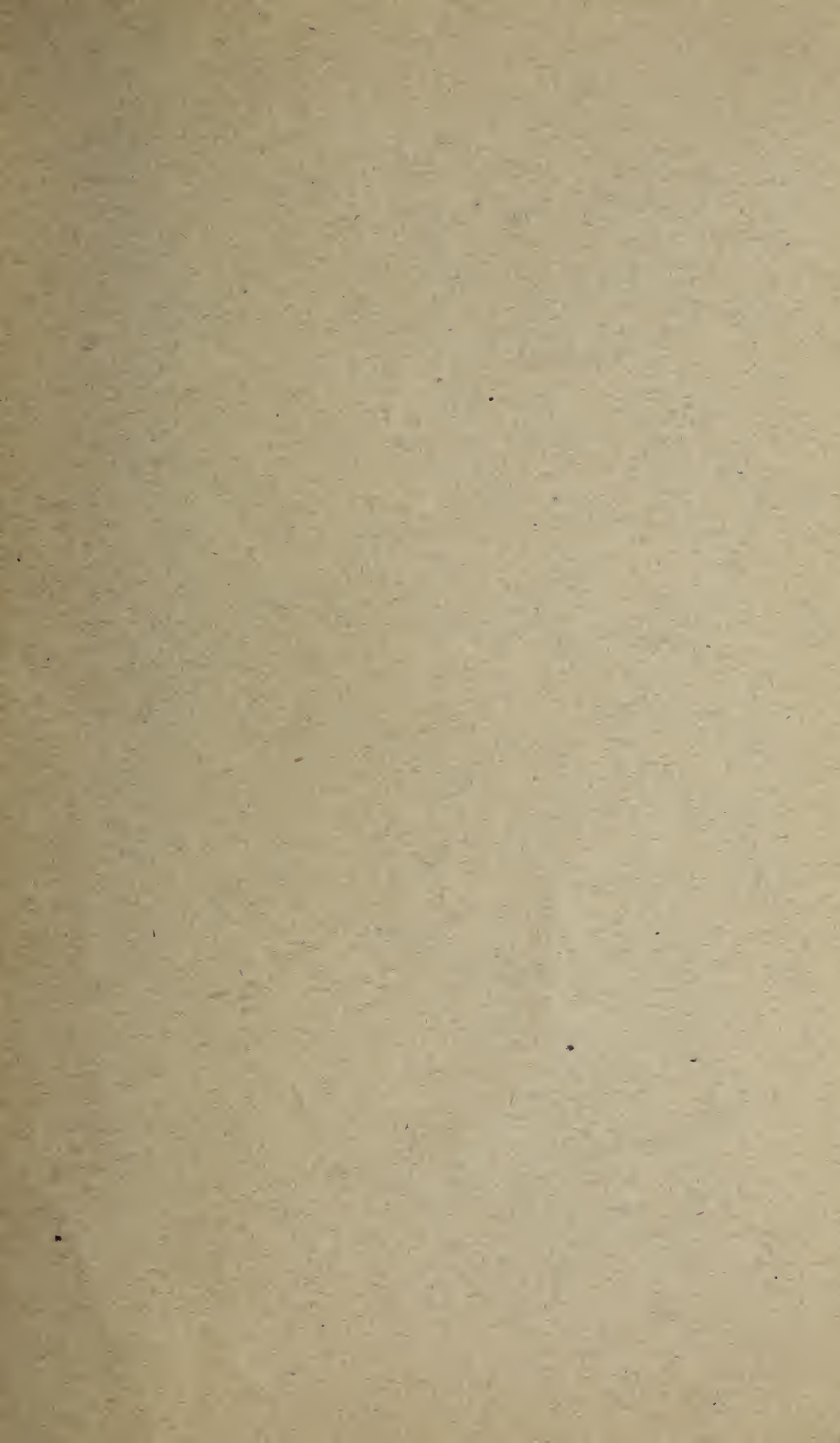
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